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The Concurrent and Longitudinal Associations of Bullying Perpetration, Acceptance of Partner Violence, and Adolescent Dating Violence Perpetration

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THE CONCURRENT AND LONGITUDINAL ASSOCIATIONS OF BULLYING PERPETRATION, ACCEPTANCE OF PARTNER VIOLENCE, AND ADOLESCENT DATING VIOLENCE PERPETRATION

by

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Abstract.

Adolescent dating violence (ADV) and bullying are both serious and prevalent public health concerns with overlapping risk factors and negative health consequences. Prior research has demonstrated significant associations between these two behaviors, with some identifying bullying perpetration as a precursor to ADV perpetration. However, few studies have examined *how* bullying influences the development of ADV. One potential influencing factor may be attitudes towards partner violence, which has been associated with both bullying and ADV perpetration. Using longitudinal data from the Centers for Disease Control and Prevention's (CDC) cluster randomized controlled trial of *Dating Matters®: Strategies to Promote Healthy Teen Relationships* (*Dating Matters®*), this dissertation assessed both the cross-sectional and prospective relationship between bullying perpetration, acceptance of male and female partner violence, and ADV perpetration. It also tested the indirect effect of bullying perpetration and ADV perpetration via acceptance of male and female partner violence and determined if these indirect effects were moderated by sex. Self-report data from 1,361 students in 21 standard of

care schools within four sites were included in analyses. Longitudinal data from four time points (Fall 2012 or T1, Spring 2013 or T2, Fall 2013 or T3, and Spring 2014 or T4) were included. Results demonstrated that across all time points bullying perpetration and ADV perpetration were significantly associated for both males and females. Prior reports of bullying, ADV perpetration, and acceptance of female partner violence were significant predictors of future reports of bullying, ADV perpetration, and acceptance of female partner violence, respectively, with some caveats across males and females. As hypothesized, T1 bullying predicted increases in T4 ADV (β=.289; SE=.106; p = .007), but only for females. On the other hand, among males, T1 bullying predicted decreases in T2 ADV (β=-.209, SE=.098, p = .032), and T2 bullying predicted decreases in T3 ADV (β=-.239, SE=.116, p = .040). Also as hypothesized, bullying predicted acceptance of male and female partner violence for females only, and acceptance of male and female partner violence significantly predicted ADV. Several significant mediational pathways were observed for males and females, yet all were counter to hypothesized indirect paths. Findings have significant implications for not only the timing of when to implement ADV prevention programming, but also for the content that should be included within adolescent dating violence programming and the individuals most at risk who should be targeted.

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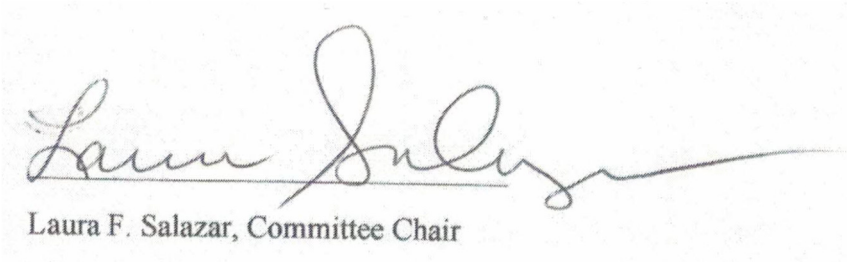

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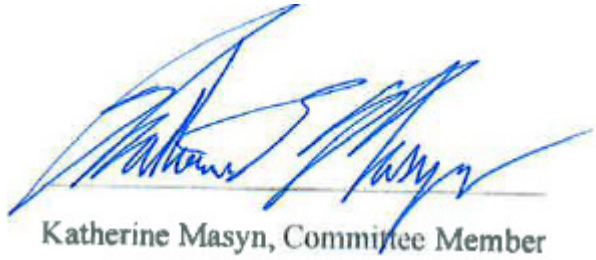

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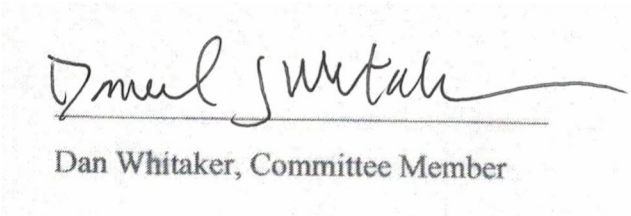

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The findings and conclusions in this report are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Author's Statement Page

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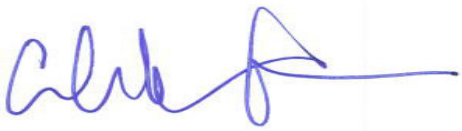

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Signature of Author, Alana M. Vivolo-Kantor

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Chapter I: Introduction and Statement of Purpose

Adolescent Dating Violence Background

Adolescent dating violence (ADV) is a serious and prevalent public health concern and is defined by the Centers for Disease Control and Prevention (CDC) as physical, sexual, emotional, or psychological behavior, including stalking, that is directed towards a current or former dating partner.[1] Nationally, it is estimated that approximately 10% of high school students have reported some form of dating violence *victimization* in the past 12 months (9.6% have reported physical violence and 10.6% have reported sexual violence).[2,3] In the 2015 national Youth Risk Behavior Survey (YRBS), female students were more likely than male students to experience physical ADV victimization (11.7% vs. 7.4%) and sexual ADV victimization (15.6% vs. 5.4%) in the past 12 months.[3] Although there are no on-going national estimates of ADV *perpetration*, in a large urban middle school sample, lifetime perpetration estimates were as large as 33% for physical (20% males and 43% females) and 15% for sexual (20% males and 10% females).[4] Surprisingly, and controversially, more females report perpetration than males in almost all ADV studies with adolescent and teen samples.[5] Needless to say, both males and females suffer the consequences of ADV perpetration. Perpetrators report a range of negative health risk behaviors and consequences following engagement in ADV perpetration.[6,7] For example, dating violence perpetrators also report alcohol use,[8,9] anxiety,[10] depression,[9-11] and sexual risk-taking behaviors.[9]

Bullying Background

Similar to ADV, bullying is also regarded as a significant public health problem in the US among school-aged youth. CDC estimates that approximately 20% of high school youth report being bullied by other students in their school each year.[3] National estimates with middle

school-aged students demonstrate larger rates – over 30%.[12] Over time, bullying trends have remained stagnant,[3] and only a few programs are showing promise in reducing bullying in US schools.[13] There is a vast literature documenting the cross-sectional correlates of bullying. For example, bullying has been associated with decreased academic achievement,[14] behavioral disorders (e.g., psychiatric and anti-social personality disorders),[15,16] psychosomatic problems,[17] and depression and suicidality.[18,19] Several longitudinal studies and meta-analyses have linked bullying perpetration to depression and future acts of delinquency and criminality, including arrests and violent convictions,[20,21] however, we know even less about how exposure to bullying as a perpetrator negatively impacts youth in US settings.

Overlap of Adolescent Dating Violence and Bullying

There is consensus that perpetration of both bullying and ADV is detrimental to youth in that it leads to negative health consequences and can increase engagement in negative health risk behaviors. Only recently has bullying perpetration been studied as an important risk factor that predicts future ADV perpetration. The relationship between bullying and ADV behaviors has been examined in cross-sectional studies; however because temporal ordering cannot be established it is important to examine longitudinal studies to better understand this relationship.[4,22-29] To date, seven studies have used longitudinal data to investigate this relation and collectively have confirmed that bullying behaviors predict subsequent ADV perpetration.[30-36]

Findings from these studies have significant implications for not only the timing of when to implement ADV prevention programming (i.e., before bullying begins), but also for the content that should be included within adolescent dating violence programming and the individuals most at risk who should be targeted. The first step in addressing the primary

prevention of these behaviors is to fully understand the timing and mechanisms in which modifiable factors that can be integrated into programming. It has been suggested that the prevention of ADV should begin with the prevention of behavioral precursors, such as bullying,[37] and important contextual factors, such as social norms.[38-43] However, only a handful of prospective studies have studied the behavioral precursors and social norms associated with ADV perpetration over time. Specifically, examining how bullying influences the development of ADV behavior and how this relationship changes over time will better position prevention programming to more precisely impact the modifiable factors that contribute to the relationship between these two behaviors.

Interplay of Acceptance of Violence on Behaviors

It has been documented in cross-sectional studies among both adults and young people that social norms, including attitudes accepting of partner violence,[8,44] are associated with partner violence perpetration. Social norms that are supportive of violence (e.g., violence is an acceptable way to resolve conflicts within a relationship) normalizes violent behavior and creates the perception that violence is warranted and an acceptable means of conflict resolution.[45,46] Most of this research has been conducted in college or older adult samples and few studies have assessed these norms in the context of adolescent dating violence.[47] What we do know from the several studies that have been conducted is that middle school[8] and high school students[48] who reported acceptance of violence towards a partner were more likely to report dating violence perpetration. Only one study has sought to understand the relationships between bullying and acceptance of partner violence; however, the study was cross-sectional and included a very specific sample of adolescents exposed to intimate partner violence in the home.[49] Thus, a closer examination of the intersection of these attitudes an important next step to fill a gap in both the

dating violence and bullying fields. The first purpose of this dissertation is to fill this gap by assessing both the cross-sectional and prospective relationship between bullying perpetration, acceptance of partner violence, and ADV perpetration. The second purpose of this dissertation is to better understand the mediating role acceptance of partner violence plays in the relationship between bullying perpetration and ADV perpetration.

The Role of Mediators and Moderators

As mentioned above the first step in addressing the primary prevention of bullying and ADV perpetration is to fully understand the modifiable factors that can be integrated into prevention programming. Though seven studies have looked at the prospective relationship between these two behaviors,[30-36] only one has tested a series of potential mediating factors that may explain this relationship.[34] In addition, to better inform prevention programming, we need to understand how these relationships may be different for male and female students. Given sex differences exist in both bullying and ADV perpetration prevalence,[8,50] exploring whether sex is a moderator of these proposed developmental pathways will advance our understanding of if and how prevention programs should be tailored by sex.

Dissertation Purpose and Research Questions

The aim of this dissertation is to fill the gaps in understanding the concurrent and longitudinal relationships between bullying perpetration, acceptance of partner violence, and adolescent dating violence perpetration across male and female students. The current dissertation will answer the following research questions (see Table 1) using longitudinal data from CDC's cluster randomized controlled trial of *Dating Matters®: Strategies to Promote Healthy Teen Relationships* Initiative:

(1) *Research Question One*: Are there concurrent associations between acceptance of partner violence, bullying perpetration, and adolescent dating violence perpetration at each time point? (See Figure 1)

(2) *Research Question Two*: Are norms and behaviors stable over time? (See Figure 2)

(3) *Research Question Three*: Do norms and behaviors at Time T predict behaviors and norms across outcomes at T+1, T+2, and T+3 (e.g., does T1 bullying predict T2 ADV and does T2 norms predict T3 ADV)? (See Figure 3)

(4) *Research Question Four*: Does acceptance of partner violence at Time 2/Time 3 partially mediate the relationship between bullying at Time 1/Time 2 and ADV perpetration at Time 3/Time 4?

(5) *Research Question Five*: Does biological sex moderate the effect of acceptance of partner violence on the relationship between bullying and ADV perpetration across time?

Chapter II: Literature Review

Adolescent Dating Violence Prevalence

Adolescent dating violence (ADV) perpetration rates are known to vary by sample and measurement characteristics,[5] yet with estimates of some forms of perpetration ranging from 15-77%[4,8] it is clear that a problem exists. Although no on-going national estimates exist for ADV perpetration, CDC's Youth Risk Behavior Survey (YRBS) provides the most widely used assessment of ADV victimization. The YRBS is a biennial cross-sectional survey administered to a nationally-representative sample of students in grades 9 through 12 in all 50 states and the District of Columbia.[51] In 2015, approximately one in ten students reported experiencing physical ADV victimization and one in ten reported experiencing sexual ADV victimization in the past 12 months.[3]

Local or multi-site efforts aimed at measuring both ADV victimization and perpetration find disparate rates particularly across different age groups, locales (urban vs. rural), and measurement strategy (YRBS items vs. more nuanced scales capturing a range of behaviors). For example, Foshee and colleagues,[33] using a binary physical dating violence perpetration variable similar to the YRBS administration, found that in a rural sample of 8th graders approximately 13% reported physical ADV perpetration in the past year. Whereas, a study by Niolon and colleagues[4] using a 40-item ADV scale with an urban sample of 6-8th graders found much higher lifetime rates: 77% reported perpetrating verbal/emotional abuse, 32% reported perpetrating physical abuse, 20% reported threatening a partner, 15% reported perpetrating sexual abuse, 13% reported perpetrating relational abuse, and 6% reported stalking.

Sex Differences in Adolescent Dating Violence Perpetration

Different ADV perpetration rates are also reported by male youth as compared to female youth in some studies. Although controversial, there is evidence that female youth report similar or greater levels of perpetration than their male counterparts. For example, some of the earliest assessments by Foshee support the notion that violence can be bi-directional in adolescent samples.[52] In a rural sample of 8th and 9th grade students she found that more female students (28%) than male students (15%) reported ever perpetrating ADV, however, a larger proportion of female students (16%) as compared to male students (5%) perpetrated violence in self-defense.[52] In addition, Foshee[52] found sex differences in the types of violence perpetrated. Across all violence perpetration types (i.e., mild physical and psychological; moderate physical and psychological; and severe physical and psychological) more female students reported perpetration than male students, with the exception of sexual violence where more male students reported perpetration.[52] Overtime and across different samples, this relationship holds. In a sample of urban middle school students, Niolon and colleagues[4] demonstrated that, with the exception of sexual perpetration, female students were significantly more likely to report threatening behaviors (24% vs. 16%), verbal/emotional abuse (82% vs. 72%), and physical abuse (43% vs. 20%) than their male counterparts. Orpinas and colleagues[35] also determined that more female middle school students report psychological ADV perpetration than male middle school students and that this relationship continues through 12th grade, where significantly more female students (53%) are reporting perpetration than male students (30%).

Several hypotheses have been proposed to explain the sex differences that emerge when assessing partner violence in adolescents. The first hypothesis in the literature focuses on the importance of measurement strategy in influencing rates of perpetration (and victimization). Teten and colleagues[5] argue that the use of behavioral checklists may not fully capture the

context in which violence occurs thus contributing to the variation in rates. In fact, a meta-analysis by Archer[53] found that when respondents were asked to report on specific behaviors using a checklist format compared to other format types, women were significantly more likely than men to have perpetrated physical violence against a partner and to have used it more often.

A second hypothesis is that the types of questions administered with youth were originally developed for and tested with adults. For example, a review of dating violence scales noted that the Conflict Tactics Scale (CTS)[54,55] and Sexual Experiences Survey[56] were used most often to capture dating violence victimization and perpetration.[57] However, because these two scales were developed primarily with adult samples, authors raise concern for the applicability and developmental appropriateness of administering these measures with adolescent populations without additional item-level evaluation.[57] Notably, Archer[53] recognized that the use of measures that included the physical consequences of aggression, such as injuries requiring medical treatment, show that males are more likely to inflict injury on partners than females. A qualitative assessment conducted by Foshee and colleagues[58] also uncovered that the interpretation of survey items led adolescents to report perpetration when, in reality, the "violence" was committed on accident or done "in play."

The third hypothesis stemming from the work of Archer[53] indicates that where the sample comes from and the characteristics of those who participate play a role in differing rates. For example, when comparing sex differences in perpetration across 82 studies, Archer[53] noted that age of the sample was a significant moderator. In studies with older samples (23-49 years old), males were more likely than females to report perpetration, yet in younger samples (14-22 years old), females were more likely than males to report perpetration. Though, without an understanding of *whom* young females are perpetrating against and the context in which this

perpetration takes place, it is difficult to conclude that females overall are more violent than males. In fact, Foshee[52] directly points out that it may be that those females who perpetrate dating violence are engaging in this violence with older partners. This age difference may, in turn, create a power differential where the female engages in violence to "level the playing field."[59]

Lastly, social desirability may play a role in these findings. Generally, male-to-female violence is not widely accepted in the US. However, views on female-to-male violence are accepted more,[8,48,60-64] thus making it plausible for a study to find higher rates of female-reported perpetration. A meta-analysis by Sugarman and Hotaling[65] supports this view – adults who reported intimate partner violence perpetration also reported fewer socially desirable responses. Needless to say, ADV perpetration may be bi-directional or mutual though the impacts may not be symmetrical. In both adult and adolescent samples, women and females account for substantially more physical injury than do men.[39,53,66-68]

Adolescent Dating Violence Perpetration Consequences and Correlates

Even though we find that prevalence varies by measurement type, sample characteristics, and sex, it is clear that rates of dating violence perpetration are still unacceptably high. Coupled with high rates is the concern that ADV is associated with a range of negative health outcomes including physical, psychological, and psychosocial factors. Unfortunately, the ADV field is limited in the availability of research stemming from longitudinal analysis; thus, making it impossible to truly understand both risk factors (i.e., those factors that place individuals at risk for ADV perpetration) and consequences (i.e., outcomes following an individual perpetrating ADV). However, over the past few decades, an extensive literature has been built documenting the cross-sectional correlates of ADV perpetration across most levels of the social ecology (e.g., individual, family, and school).[69]

A large number of cross-sectional studies on ADV report that for both sexes, perpetration is correlated with a variety of risk factors and behaviors. Reviews of the extant literature have documented several individual-, relationship-, and community-level factors with significant relationships to ADV perpetration for both males and females. For example, several risk-taking behaviors including early initiation of alcohol use,[70] tobacco use,[10] and delinquency[4] are correlated with ADV perpetration. In addition, research demonstrates that several sexual risk-taking behaviors are associated with ADV perpetration including not using condoms[71] and having sexual intercourse with other individuals outside their monogamous partner.[44] ADV perpetrators are also more likely engage in early initiation of sexual intercourse[4] and to test positive for HIV and STDs than non-perpetrators.[71,72] As compared to non-perpetrators, ADV perpetrators report more anger,[73] anxiety[10], and emotional disturbances[4] including depression[10,74] and suicidality.[75] We also know that family structure (i.e., living with single parents),[60] exposure to community violence,[4,60,76] and exposure to family violence,[60,76] are significant correlates of ADV perpetration.

A limited number of longitudinal studies have sought to understand the predictors and consequences of ADV perpetration. A recent review by Vagi and colleagues[6] catalogued 53 longitudinal risk factors for ADV perpetration. A vast majority are consistent with the findings listed above for cross-sectional studies, but several important new factors were identified. Having friends or close peers who perpetrate dating violence[10,66] and are also victims of dating violence,[8] having attitudes accepting of violence,[77] having more acceptance of violence in a dating relationship,[8] and having a history of child physical abuse victimization[78] were significant predictors of ADV perpetration. Seven studies were able to link a history of aggression and

violence to dating violence perpetration in middle school, high school, and college samples.[10,36,79-83]

Connecting the Dots across Problem Youth Behaviors

Over the past few years, research has emerged linking ADV to other forms of violence including sexual violence,[84,85] sexual harassment,[24,86,87] and bullying.[30-36] Though these forms of violence may seem distinct, differentiation between ADV and bullying has been challenging.[88] The CDC uniform definition of bullying, published in 2014, states that bullying is "any unwanted aggressive behavior(s) by another youth or group of youths who are not siblings or current dating partners that involves an observed or perceived power imbalance and is repeated multiple times or is highly likely to be repeated." (pg. 7),[89] and explicitly excludes behaviors that occur between dating partners. Instead CDC emphasizes that bullying occurs among "peers" with an imbalance of power. However, in reality, the two forms of violence may overlap a significant amount, particularly in younger populations when "dating" takes many forms. For example, qualitative focus groups conducted by Fredland and colleagues[90] found that the term "dating" was used to describe relationships that were serious in nature, but were mostly reserved for older teens not younger adolescents. Younger adolescents in the focus groups more often referred to dating as "talking to" or "hanging out" with those of the opposite sex in group settings. Thus, it is not quite clear at what point a member of the opposite sex moves from a peer to an "intimate partner," which makes identifying these behaviors as distinct a real struggle.

Only recently have the interconnections between the two forms of violence been studied both cross-sectionally and longitudinally with adolescents and teens. Cross-sectional studies have demonstrated associations between bullying victimization and ADV perpetration[4] as well as bullying perpetration and ADV perpetration.[22,23,29] To date, seven studies have looked at the

longitudinal association between bullying perpetration and/or victimization and dating violence perpetration[30-36] and findings suggest that across both sexes, bullying perpetration and victimization predate and predict ADV perpetration. This relationship holds for middle school-aged youth[33] as well as high school-aged youth,[30-32,34-36] and also different forms of bullying and dating violence. For example, separately reports of physical bullying and/or relational bullying[30,31,33,36] predict physical ADV perpetration. Using composite bullying measures inclusive of multiple types of bullying including physical, relational or verbal harassment also predicts both physical ADV perpetration,[34] psychological ADV perpetration,[35] and sexual ADV perpetration.[32] See Table 2 for a description of the studies including sample size, recruitment, measures and results.

Gaps in Current Research Linking Bullying and Adolescent Dating Violence

The research described above represents the state of the field on linking bullying and ADV, longitudinally. One major gap remains. We lack evidence to explain *wh*y bullying and ADV are associated. The longitudinal assessment by Foshee and colleagues[34] represents the first study to test a series of potential mediating factors that may explain this relationship. Unfortunately, only one of the proposed mediators (i.e., anger) was significant in explaining the relationship between bullying perpetration and physical dating violence perpetration. The lack of understanding regarding factors that influence the relationship between bullying and ADV impacts our ability to both reduce bullying behaviors and prevent ADV. For example, a majority of ADV prevention programs include content on skills building, conflict management, and norms change[38,40,41,91,92] based on evidence that these factors are associated with ADV.[6] It may be that bullying early in adolescence both contributes to and exacerbates these attitudes, norms, and behaviors; thus, primary prevention programs for ADV that are implemented in high school may

be missing the mark and less effective. Because schools are most concerned about preventing bullying behaviors (as opposed to dating violence),[84] there is a real opportunity to integrate these interconnected mediating factors that impact ADV into bullying prevention programs.

The Interplay of Shared Risk Factors and Potential Mediators

With the documentation of overlap across both bullying and ADV perpetration, questions are emerging surrounding the shared or interconnected risk/protective factors across these behaviors and potential mediators contributing to the relationship. Some recent research has sought to examine both the unique and shared factors associated with both bullying perpetration/victimization and ADV perpetration. However, similar to dating violence, very few longitudinal assessments of bullying risk factors and consequences exist. A review[50] found that bullying perpetration was associated with externalizing behaviors, negative cognitions (including thoughts, beliefs, feelings, or attitudes about themselves/others; normative beliefs about themselves/others; empathy; perspective taking; self-respect; self-esteem; and self-efficacy), negative peer influence, poor family environment and decreased peer status (including quality of relationships children and adolescents have with their peers, including rejection, isolation, popularity, and likeability). There is evidence that bullying victimization and perpetration is associated with decreased academic achievement,[93] significant letter grade decreases,[94] psychiatric disorders (e.g., attention deficit/hyperactivity disorder, oppositional defiant disorder, and conduct disorder),[15,16] suicidal ideation and behaviors.[17,18,95-97] Also, there is some emerging evidence that youth who bully others are also more likely to endorse negative attitudes towards non-traditional gender roles and greater use of homophobic epithets to bully others.[85,98] Engaging in these behaviors and holding these beliefs may likely increase the chances of perpetrating violence against a dating partner.

Even though these factors mimic those described above for dating violence, few studies have sought to empirically test these shared factors in a single model. Only one study, to date, has explicitly examined whether bullying and ADV share risk factors or have unique risk factors. In analyses studying whether physical dating violence perpetration, bullying perpetration, and sexual harassment perpetration share modifiable risk factors,[49] single risk factor models and combined risk factor models were estimated. In models examining a single risk factor at a time, acceptance of sexual violence, mother-adolescent discord, family conflict, low maternal monitoring, low mother-adolescent closeness, low family cohesion, depressed affect, feelings of anger, and anger reactivity were all shared across bullying perpetration and ADV perpetration. When these factors were included simultaneously only injunctive norms (i.e., acceptance of dating violence) emerged as a significant shared factor between bullying perpetration and ADV perpetration.

Importance of Violence Norms

Based on the results from Foshee and colleagues's cross-sectional study,[49] acceptance of partner violence was the only significant shared correlate of both bullying perpetration and ADV perpetration. It has long been asserted that acceptance of violence is one of the best predictors of violent behavior.[99-102] Consistently, endorsement of beliefs that the use of violence towards a dating partner is acceptable predicts ADV perpetration[8,48,60-64] and beliefs towards aggression (i.e., aggression is acceptable, warranted and deserved) predicts bullying perpetration.[103]

Among high school students, youth with more accepting attitudes towards the use of violence in a dating relationship were more likely to also report psychological ADV and/or physical ADV perpetration for both males and females.[60,63,64] One of the only cross-sectional studies to assess the relationship between acceptance of partner violence and ADV perpetration

within a middle school sample has replicated these findings, with some nuances. At the bivariate level, acceptance of male violence and acceptance of female violence were associated with both physical and psychological ADV perpetration. On the other hand, in adjusted models, acceptance of female violence predicted physical, but not psychological ADV perpetration, and acceptance of male violence predicted psychological, and not physical ADV perpetration.[62]

Longitudinal studies have also assessed the relationship between acceptance of partner violence and ADV perpetration.[8,48,61,73,77,104] All but one[73] identified significant relationships over time. For example, a study with high school students demonstrated that acceptance of both female and male violence predicted physical ADV perpetration a year following the first assessment[77] and in a sample of middle school students acceptance of both female and male violence predicted moderate and severe ADV perpetration over time.[61] Also, justification of verbal and coercive violence tactics with a dating partner predicted verbal ADV perpetration.[104] However, analyses also suggest that sex differences may be present. Acceptance of violence has been shown to predict physical ADV perpetration over time but only for males (the relationship for females was not significant).[8]

In the bullying literature, multiple studies have found that peer violence norms (e.g., "Boys sometimes deserve to be hit by other boys.") were significantly associated with involvement in bullying perpetration.[103,105,106] This correlation has also been found when youth are asked specifically about bullying norms (e.g., "Children should be allowed to bully others who deserve it").[107] Recent research also finds this relationship when the norms are around partner violence – acceptance of partner violence and bullying perpetration are significantly and positively associated at the same point in time.[49] That said, no studies, to date, have assessed the temporal ordering of this relationship with longitudinal data.

The Development of Violence Norms and Application to Behaviors

As important as it is to better understand these links longitudinally, it is clear that the development of violence norms can occur in multiple contexts. The development of these norms, whether prior to violence experiences or as a consequence of experiencing or engaging in violence, likely influences future behaviors. There are several theories that may help to explain the proposed associations between acceptance of violence with bullying perpetration and ADV perpetration. The first of which is the Theory of Reasoned Action/Planned Behavior. This theory, developed by Ajzen and Fishbein,[108] posits that an individual's behavior is determined by his/her intention to perform the behavior, and that this intention is, in turn, a function of his/her attitude toward the behavior and his/her norms about the behavior. Attitudes towards a specific behavior include behavioral beliefs (i.e., beliefs about the consequences of that behavior) and outcome evaluations (i.e., judgments about the features of the behavior) and norms include normative beliefs or how an individual perceives others in their context would like them to behave and motivations to comply. Also included in this model is perceived behavioral control which is an individual's perceptions about their ability to perform a given behavior. Thus, in support of this theory, it is possible that youth develop norms that support violence that then influence risk for engaging in bullying and ADV.

In fact, the literature supports this assertion. According to Huesmann's social information processing model, normative beliefs play an important role in supporting both inappropriate and unacceptable behaviors.[100,109] However, consistent with the theory of cognitive dissonance[110] and self-perception theory[111] an individual may develop these normative beliefs based on their previous or current behavior. For example, it may be that youth who are more aggressive already have stronger normative beliefs around the acceptable use of violence,

but also the normative beliefs of those whom use violence may be supported and promoted over time. Therefore, we may expect that an association between acceptance of partner violence and bullying perpetration be, in part, due to the impact that bullying perpetration has on changing acceptance of partner violence.

Although it is unclear about the timing of the initial development of these norms, we do understand more about the factors that contribute to how these norms are reinforced in certain contexts. As early as the first grade children appear to differentiate normative beliefs about aggression and the strength and influence of these norms continue to increase through the elementary school years.[100] Children's normative beliefs may then impact the ways in which they perceive the norms and behaviors of others. Hence, the social norms theory may also provide some context around these associations. Social norms theory is applied in situations where individuals incorrectly perceive that peers or other community members have attitudes and/or behaviors that are dissimilar to their own.[112] For example, this theory, as applied to bullying or dating violence, suggests that this misperception of norms and/or behaviors influences an individuals' own behavior. In some situations, these misperceptions can lead to pluralistic ignorance, which describes the condition whereby an individual privately rejects the group norm while inaccurately believing all other members of the group accept the group norm.[113] Complementary to social norms is the realization that children and adolescents are influenced by and model the beliefs and behaviors of parents and peers.[114] It has been argued that the beliefs of both peers[115] and parents[116] aid in the formation of violence acceptance. Even more so, repeated exposure to messaging supporting the use of violence, whether generally or within dating relationships, is said to alter both significant and behavioral processes leading to the desensitization of violence.[117]

The confluence of theoretical frameworks presented suggests that perhaps early bullying behaviors set the stage for the development of normative beliefs around the acceptance of violence and that these behaviors and norms work in concert over time. Once adolescents develop these norms around the acceptance of general violence, the progression towards accepting partner violence is logical given the linkages between bullying and dating violence. Because we know that adolescents who engage in bullying report dating earlier and participate earlier in dyadic dating instead of group dating, it is also reasonable to assume that they have formed normative beliefs around the acceptability of abusing a dating partner. The primary goal of this dissertation will be to test these theoretical links by analyzing the concurrent (see Figure 1) and longitudinal relationships (see Figures 2 and 3) between acceptance of partner violence, bullying perpetration, and ADV perpetration across male and female students. In addition, a secondary purpose is to determine if the relationship between bullying and ADV perpetration is dependent on the influence of acceptance of partner violence.

Research Gaps

As presented above, the current state of the field linking bullying to acceptance of partner violence has yet to address the temporal ordering of these factors. Furthermore, existing research has yet to assess the concurrent and longitudinal relationships among these variables over time in the same model. A lack of longitudinal research has not allowed us to consider how norms change over time in middle school and how this change influences subsequent behaviors. Understanding how norms evolve over time will provide invaluable information on the timing and content of violence prevention programming for middle school students. Also, only one study has tested theoretical mediators of the relationship between bullying and ADV perpetration. Analyses for this dissertation, which uses longitudinal data from CDC's cluster

randomized controlled trial of *Dating Matters®: Strategies to Promote Healthy Teen Relationships* Initiative, may allow us to make generalizations of how ADV perpetration and bullying perpetration develop and change over time in high-risk, urban middle school students across the US.

Summary

Problematic behaviors, including ADV perpetration and bullying perpetration, have both short- and long-term negative impacts on the physical, psychological, and psychosocial health of youth. Due to these negative health outcomes, the primary prevention of ADV perpetration and its behavioral precursors have been a priority of public health practitioners over the past few decades. Still, the development of research-informed primary prevention programs is dependent on the best available evidence of risk factors that play a role in the development of ADV perpetration. Preliminary evidence demonstrates that bullying perpetration is an important behavioral precursor to ADV perpetration; yet, little is known about the shared risk factors associated with both behaviors concurrently and prospectively. With some indication that acceptance of partner violence is a shared risk factors for both ADV perpetration and bullying perpetration, this dissertation will aim to fill the gaps in understanding the concurrent and longitudinal relationships between these variables including the mediating role of acceptance of partner violence on the relationship between behaviors.

Chapter III: Method

Study Design

Data for this study are drawn from a cluster randomized controlled trial to evaluate CDC's *Dating Matters® Strategies to Promote Healthy Teen Relationships* Initiative (*Dating Matters®*).[38,92,118] In the evaluation, 46 schools across four sites were randomly assigned to receive either the *Dating Matters®* comprehensive approach or the "standard of care" approach, which included the Safe Dates program for eighth grade students only.[119] Local health departments in each of the four sites were responsible for program implementation, NORC at the University of Chicago (NORC) was responsible for the consenting process and administering the surveys described below. The *Dating Matters®* evaluation design includes five cohorts of students (see Figure 4) with a new cohort of students added each year until the fall 2015.[118]

Participants

The present investigation utilizes data collected at four time points from sixth (N=637) and seventh grade (N=724) students enrolled in standard of care schools (N=21) who entered the evaluation study in the 2012-2013 school year. Sample size at each time point varies – 945 students took a survey at Time 1, 755 took a survey at Time 2, 975 took a survey at Time 3, and 735 took a survey at Time 4. Of the 1361 students, 517 (38%) were enrolled in schools in Alameda County, California, 291 (21.4%) in Baltimore, Maryland, 371 (27.3%) in Broward County, Florida, and 182 (13.4%) in Chicago, Illinois. The sample was mostly female (52%) and a majority self-reported being non-Hispanic black (N=653; 49.2%) or Hispanic ethnicity (N=515; 38.8%); only 52 students (3.9%) were non-Hispanic white.

Participants also self-reporting dating status at each time point. At Time 1, 445 (29.9%) students reported ever dating, and 397 (58%), 545 (62.6%), and 387 (59.6%) at Times 2, 3, and 4

reported ever dating, respectively. For both concurrent and longitudinal analyses that included the questions on dating violence, students who reported they had never dated at all of the four time points (N=392) were excluded, leaving 919 students for analyses. All concurrent analyses described in Research Question 1 will include the dating sample at each time point; however, participants in Research Question 2 will vary. For example, assessment of bullying perpetration over time will use the full sample (N=1361) whereas, the assessment of ADV over time will use a sample of students who reported dating at any of the four time points ("ever-daters"). The ever-dated sample (N=919) will also be used in Research Questions 3 through 5. See Table 3 for an overview of sample breakdown by research question. Comparisons of the ever-dated sample and the non-dating sample on all control variables are presented in Table 4. Of the 919 youth who ever dated, 327 (35.6%) were enrolled in schools in Alameda County, California, 213 (23.2%) in Baltimore, Maryland, 244 (26.6%) in Broward County, Florida, and 135 (14.7%) in Chicago, Illinois. The sample was evenly distributed by sex (51% male) but were mostly 7th grade students (56%), and of non-Hispanic black race (N=476; 53%) or Hispanic ethnicity (N=322; 35.9%).

Procedure

All procedures and materials for the study were approved by multiple Institutional Review Boards, including CDC, NORC, GSU, and several local boards. All students enrolled in participating middle schools in Alameda County, Baltimore, and Chicago were recruited to take two surveys per school year in middle school (fall and spring, which occurred at least four months following the fall data collection) and one survey per year while in high school. In Broward County a random sample of students in each middle school was taken because of the large size of the school population.

Prior to the fall data collection, leads at the local health departments and NORC partnered with school staff to distribute and collect parental consent forms. Active parental consent (i.e., parents were asked to sign and return a consent form to give or decline consent for their child's participation) and adolescent assent was required for survey participation. The overall consent form return rate was approximately 62%. Of the consent forms returned, almost three fourths of parent consent forms provided permission survey participation. Adolescent assent was required at each survey administration. Surveys were administered using multiple methods including in schools by trained research staff using self-administered paper-and-pencil questionnaires and over the phone. The questionnaires remained the same at each survey administration; however time referent periods changed from "In your lifetime…" at Time 1 to "In the last four months…" in each subsequent survey administration for dating violence. The questionnaire contained approximately 60 questions, which focused on dating violence behaviors, attitudes, norms, and knowledge; other health risk behaviors such as risk sexual behavior, alcohol and drug use, delinquency, and bullying; and included items on intervention exposure. Additional information about *Dating Matters*® can be found in Niolon and colleagues[118] and questionnaires are available at http://www.norc.org/Research/Projects/Pages/CDC-Dating-Matters-Experimental-Evaluation.aspx.

Measures

Socio-demographic characteristics and covariates. Socio-demographic variables included Time 1 sex, grade (as a proxy for age), and race/ethnicity. Sex was measured with female and male biological sex. Grade was measured 6th grade (cohort 3) and 7th grade (cohort 2). Race/ethnicity was captured with two questions: 1) "Are you Hispanic or Latino?" (Response options were "yes" or "no"), and 2) "What is your race?" (Response options were

"American Indian or Alaska Native," "Asian," "Black or African American," "Native Hawaiian or other Pacific Islander," "White," and "Other"). Using the national Youth Risk Behavior Survey as a guide,[3] students were classified as "Hispanic/Latino" if they answered "yes" to the first question, regardless of how they answered the race question. Students were then categorized as Hispanic/Latino, non-Hispanic white, non-Hispanic black, and other non-Hispanic race. For example, students who answered "no" to being Hispanic/Latino and selected only one racial group (e.g., white) were classified as "non-Hispanic white". Students who selected multiple racial groups were classified as "other, non-Hispanic." For the analyses described below, a revised version of race/ethnicity was used. A variable with three mutually exclusive categories was created due to small cell sizes in the non-Hispanic, white, non-Hispanic, other, and non-Hispanic, mixed categories. The three categories includes: Hispanic, non-Hispanic black, and non-Hispanic, other, which combines the non-Hispanic, white, non-Hispanic, other, and non-Hispanic, mixed categories. Additional covariates will include dummy variables for site to be included as a fixed effect and school number to adjust for the clustering of schools.

Acceptance of partner violence. Acceptance of partner violence was measured using a modified version of a scale developed for use in the efficacy evaluation of Safe Dates.[119] The original measure included eight items measured on a four-point Likert scale – strongly agree, agree somewhat, disagree somewhat, and strongly disagree. In the original scale, all items were summed to create a continuous, cumulative scale. Higher scores indicated more acceptance of partner violence. Foshee and colleagues[8] examined internal consistency using Cronbach's alpha which indicated alpha was .69 for a sample of 8th and 9th grade students. In the current study, an item was removed and revisions were made so that participants were responding to items capturing the same behaviors by males and females. The following five items captured

acceptance of male partner violence ("It is OK for a boy to hit his girlfriend if she did something to make him mad."; "It is OK for a boy to hit his girlfriend if she insulted him in front of friends."; "Girls sometimes deserve to be hit by the boys they date."; "A girl who makes her boyfriend jealous on purpose deserves to be hit."; "It is OK for a boy to hit a girl if she hit him first.") and the following five items captured acceptance of female partner violence ("It is OK for a girl to hit her boyfriend if he did something to make her mad."; "It is OK for a girl to hit her boyfriend if he insulted her in front of friends."; "Boys sometimes deserve to be hit by the girls they date."; "A boy who makes his girlfriend jealous on purpose deserves to be hit."; "It is OK for a girl to hit a boy if he hit her first."). In this dissertation, only items that ask specifically about acts perpetrated against a girlfriend or boyfriend will be used in analyses, thus two items were removed – "It is OK for a boy to hit a girl if she hit him first" and "It is OK for a girl to hit a boy if he hit her first."

Bullying perpetration. Bullying perpetration was measured using a modified version of a reliable and valid measure, the Illinois Bully Scale.[120] The original Illinois Bully Scale includes 16 items, nine items on perpetration and seven items on victimization. For the purpose of decreasing the length of the *Dating Matters*® survey, several items were removed from the scale in consultation with the scale developer. The modified version includes eight items (six perpetration and two victimization items). Students are asked, "In the last 30 days at school, how often did this happen?" with four response options – never, 1 or 2 times, 3 or 4 times, 5 or more times. A sample item is, "I spread rumors about other students." Traditional scoring for the Illinois Bully Scale first assigns a numeric value to each response option (i.e., never=0, etc.). Next items are summed to create a continuous or count "bullying perpetration" and "bullying victimization" score for each individual. In some circumstances, the perpetration and

victimization sub-scales have been summed and used separately in analyses as binary indicators.[4] In this dissertation, only perpetration items will be used in analyses.

Dating violence perpetration. The primary outcome of interest in this study is dating violence perpetration. Dating violence was measured using the Conflict in Adolescent Dating Relationships Inventory (CADRI),[121] which includes a total of 50 items; 25 of which capture victimization and 25 capture perpetration. All items are measured on a four-point Likert scale – never, seldom, sometimes, and often. Analyses by scale developers determined five latent factors representing physical, sexual, relational, threatening, and verbal abuse.[121] In addition to the CADRI, the *Dating Matters*® survey included 12 items from the Safe Dates scale – six victimization and six perpetration – that included more severe forms of physical violence (i.e., "I threatened him/her with a knife or gun including waving or pointing a knife."; "I choked him/her; I used a knife or fired a gun at him/her."; "I scratched him/her and/or bent his/her fingers."; "I burned him/her."; and "I bit him/her."). In order to be consistent with the CADRI response options, a range from "never" to "often" was also used; however, the development and validation studies of the CADRI used response options of "never" to "10 or more times."[119] In this dissertation, only perpetration items from the physical, relational, threatening, and verbal abuse constructs will be used in analyses. Low item endorsement for the sexual violence sub-scale prohibited its use. See Table 8 for items from the physical, relational, threatening, and verbal abuse constructs as well as the additional Safe Dates constructs.

In order to answer the CADRI and Safe Dates items, participants were first asked about their dating status with the following prompt: "*The next questions ask about "dating." By "dating," we mean spending time with someone you are seeing or going out with. Examples of this might include hanging out at the mall, in the neighborhood, or at home or going somewhere*

together like the movies, a game, or a party. It doesn't have to be a formal date or something you planned in advance and it may be with a small group. The term "date" includes both one-time dates and time together as part of long-term relationships." Students were then asked, "Have you ever DATED someone, including, for example, someone you spent time with or someone you are/were seeing or going out with?" with response options of yes and no, which instructed students to skip all questions about dating violence and other questions about dating relationships.

Analytic Strategy

All data were managed and cleaned using SPSS version 23 and R. The data structure for *Dating Matters*® is complex and thus requires a robust methodological approach to handling missing data. Before any missing data techniques were applied to this data, it was first determined that missingness likely did not violate the assumptions of missing data solutions that require that missing data approximate a missing at random (MAR) structure.[122,123] The variation in the amount and type of missing did not differ over time but as the participants progressed through the survey, the amount of missing response values increased. For example, ADV had the smallest percent amount missing compared to bullying, though ADV was one of the first questions on the survey and bullying was one of the last. The amount of missing data for all items also varied by time point. Of those students participating in the Time 1 survey, missing data ranged from 4.5% to 36.7%. Missing data ranges were similar for Time 2 (8.6-32.9%), Time 3 (10.1-32.7%), and Time 4 (13.7-23.5%).

As mentioned above, sample size at each time point varied – 945 students took a survey at Time 1, 755 took a survey at Time 2, 975 took a survey at Time 3, and 735 took a survey at Time 4. Almost one third of the respondents only took two surveys (N=406; 29.8%), followed

by three surveys (N=335, 24.6%), four surveys (N=331; 24.3%), and one survey (N=289; 21.2). Table 5 provides a breakdown of all missing patterns for time points.

All models for research question one and two were estimated using Mplus 7.2[124] with weighted least squares mean- and variance-adjusted estimators (WLSMV) for categorical outcomes and theta parameterization.[124] WLSMV uses all available data to yield accurate estimates and standard errors based on a pairwise present process that has stricter assumptions than MAR, but not as strict as missing completely at random (MCAR).[125] For research questions three, four and five, I used the continuous factor scores saved from models estimated in research question one with maximum likelihood estimation and robust standard errors (MLR). Moving to MLR from WLSMV allowed for the use of Mplus's full information maximum likelihood (FIML) procedure for analyzing data with missing values.[123] The FIML process does not impute the data, and is considered a robust modern analytic approach to missing data that preserves power for longitudinal data.[122] These models included continuous factor scores and utilized robust maximum likelihood estimates. For use in FIML, using the Quark package in R,[126,127] auxiliary variables were created using Principle Components Analysis (PCA). The auxiliary variables are a result of an iterative process wherein resulting variables inform the missingness across all study variables.

All models also adjusted for site and school. The *Dating Matters*® program was implemented in four sites across the U.S., but 46 schools were randomly selected to receive *Dating Matters*® or the standard of care program. Thus, analyses must take into consideration the nested nature of the data – students are nested within schools that are then nested within site). Site was entered as a fixed effect with dummy variables for each site. To control for the clustering of student data within schools and to account for the non-independence of student

data, a sandwich estimator was used to compute adjusted standard errors using TYPE=COMPLEX and Cluster=SCHOOL.

Structural equation modeling (SEM) was used to address the research questions in three stages: measurement models and factorial invariance testing using WLSMV, SEM with mediation using continuous factor scores, and SEM with moderated mediation by sex using continuous factor scores. In Stage One, in order to lay the foundation for all measurement models, confirmatory factor models (CFA) were estimated for bullying perpetration, acceptance of partner violence, and adolescent dating violence perpetration for the full sample and dating sample (as required and described above) beginning only with the Time 1 sample. Decisions about final factor structure take into account the original structure developed by CDC's *Dating Matters®* evaluation team, but also consider item and latent factor distributions as well as overall model fit using model fit statistics, including the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). CFI and TLI values above .95[128] and RMSEA values equal to or below .08[129] with an upper bound confidence interval <.1 indicate good model fit. In Stages Two and Three, structural paths were added to the final measurement models to test for mediation (Stage Two) and mediated moderation (Stage Three) using the multiple group framework.

Stage One: Measurement models and factorial invariance testing. In previous administrations of the acceptance of partner violence scale, a single unidimensional construct was constructed.[119] For example, items across acceptance of female and male partner violence were summed and used as manifest variables in all analyses. CDC's *Dating Matters®* evaluation team conducted a one factor CFA to mimic past use of the scale and found inadequate fit for the one factor solution. Next, a two factor solution was estimated whereby, items on acceptance of female

partner violence and acceptance of male partner violence loaded onto separate factors, thus testing two latent continuous constructs. In this model, items with the largest and smallest factor loadings were parceled together. Parceling is an approach that takes the average of two or more items to create an aggregate-level indicator.[130] The final model included two latent constructs with three indicators for each construct - two of which were parceled items for each construct.

The bullying scale structure determined by CDC's *Dating Matters*® evaluation team included two continuous latent constructs: victimization (two items) and perpetration (six items parceled into three indicators). The parceled items in the bullying perpetration factor included (1) "I upset other students for the fun of it" and "I spread rumors about other students," (2) "In a group I teased other students" and "I excluded other students from my clique of friends," and (3) "I helped harass other students" and "I started (instigated) arguments or conflicts." This dissertation will only use the perpetration items and overall perpetration construct.

The CADRI CFA was first fit using the same structure as developed by CDC's *Dating Matters*® evaluation team.[131] In preliminary analyses, the CDC *Dating Matters*® evaluation team first fit a bifactor model where factor loadings were specified for both specific (i.e., physical construct) and the common (i.e., adolescent dating violence as a whole) variance.[132,133] In these models, items were first transformed to three categories instead of four (i.e., never, seldom, and sometimes/often) and then treated as continuous indicators of both the six specific latent constructs (i.e., physical, sexual, relational, threatening, verbal, and severe physical abuse) and the larger ADV global construct. Results indicated that common variance for the larger ADV construct was most salient for both perpetration and victimization.[131] Thus, a bifactor model was not supported. The final factor structure as determined by the CDC *Dating Matters*® team included an overall ADV latent construct with facet parceling for all subscales at the mean. Facet parceling takes

individual items that share relevant content and groups them into a specific parcel.[134] For example, all items that ask about physical acts would be grouped into a parcel. Facet parceling reflects a higher order CFA rather than a bi-factor, which is consistent with the original structure determined by Wolfe and colleagues and is theoretically supported.[121,130]

With final measurement models in place (described in the Results section below), I then tested for measurement or factorial invariance by sex, grade, and race/ethnicity with successive multi-group CFAs. Invariance was also tested over time but outside of the multi-group framework. Measurement invariance across groups is an important first step in building structural models in Mplus because it attempts to verify that the factor determined in the CFA process are measuring the exact same latent construct across each group. Without invariance, there is no guarantee that differences across groups are due to real differences and instead may be due to differential functioning of the construct across groups.[135]

To determine invariance, first, a configural model was fit to the data and used as a baseline model by which all subsequent models are compared. In this model, separate CFAs were estimated for each sex, each grade level, and each racial/ethnic group. The configural model is specified such that each group (e.g., males and females) has the same pattern of fixed and free factor loadings and other parameters with no equality constraints. If the configural model fit the data, a metric model was specified and tested against the configural model such that the factor loadings across groups were constrained to be equal and unit variances were fixed at 1. Finally, a scalar model was fit such that factor loadings and thresholds across groups were constrained to be equal with the unit variance constraint. Each model will be compared to the previous model (e.g., configural versus metric and metric versus scalar and scalar versus

configural) using the DIFFTEST option in Mplus and by assessing change in CFI (ΔCFI).[136] If necessary models for partial metric and/or partial scalar were estimated.

Stage Two: Path Models with and without Mediation (Research Questions One through Four). The second stage investigated the concurrent and longitudinal associations among all variables and mediation all within a single model. Within the multiple group framework, the same SEM model will be estimated for males and females, simultaneously.[137] See Figures 1-3 for a visual depiction of each model broken down by research question for visual ease. Figure 1 shows the concurrent associations between bullying perpetration, acceptance of male partner violence, acceptance of female partner violence, and adolescent dating violence perpetration at each time point (Research Question One). Only the dating sample at each time point was used in analyses (see Table 3). In Figure 2 each variable (i.e., acceptance of male partner violence, acceptance of female partner violence, bullying perpetration, and ADV perpetration) was predicted by its value at the previous time point to control for relationships in each construct over time (i.e., autoregressive path; Research Question Two). Additional covariates are included in this model such as race/ethnicity, cohort, and site. For the autoregressive paths with the ADV perpetration variables, the "ever dated" sample was used (see Table 3).

For Research Question Three, Four, and Five, factor scores from the models testing the within time point relationships were saved using the SAVEDATA function in MPlus. Using factor scores, instead of estimating the full measurement model, was necessary due to the complexity of the models and to assist in model convergence. Factor scores are an estimate of the latent construct for each respondent in the sample.[138] Factor scores are used to estimate the true factor, but without the inherent measurement structure model some bias is introduced.[139]

While similar to the idea of "summing" items or taking the mean of items to create a continuous scale, the generation of factor scores in MPlus uses a more robust method for calculation. For example, when using WLSMV estimation, MPlus uses the Maximum A Posteriori (MAP) method to generate scores, which is a refined regression method.[140] This regression approach takes into account the estimated CFA model as well as observed individual data.[140]

Figure 3 addresses the analyses in Research Question Three, Four, and Five. Specifically, this depicts the cross-lagged effects of the variables using factor scores. The autoregressive paths, shown in Figure Two, represent the amount of variance explained by students' responses to the same construct across time while the cross-lagged effects, shown in Figure Three, denote the amount of variance explained across time between constructs while controlling for all other autoregressive paths (p. 182).[122] In Research Question Four, mediation analyses were conducted. Mediation refers to the mechanism (i.e., acceptance of partner violence) by which one construct (i.e., bullying) exerts a directional influence on another construct (i.e., ADV). Indirect effects were estimated as the product of the path from bullying to acceptance of partner violence (the *a* path) and the path from acceptance of partner violence to ADV (the *b* path) using MODEL INDIRECT.[141]

Stage Three: Moderated Mediation (Research Question Five). The last stage of analyses tested for moderated mediation by sex. Moderation of the mediated pathways was examined with contrasts of mediated effects using the multiple group SEM approach.[142] As described above, within the multiple group framework, the same mediation model was estimated for males and females, simultaneously. The differences between the indirect effects for males and females was examined using model constraints.

Chapter IV: Results

Preliminary analyses

Tables 6, 7 and 8 provide the counts and percentages for each item, over time, for bullying perpetration, acceptance of partner violence, and ADV perpetration, respectively. Based on the distribution of these items, all item response categories were collapsed into one of two categories. For example, at Time 1, 37.8% of all students reported at least one form of bullying, at Time 2, 37.8% of all students reported at least one form of bullying, at Time 3, 36.3% of all students reported at least one form of bullying, and at Time 4, 37.6% of all students reported at least one form of bullying. Across all time points approximately 60% of students reported agreeing with at least one attitude towards female partner violence (Time 1=69.2%; Time 2=60.2%; Time 3=64%; Time 4=56.3%), approximately 21% of students reported agreeing with at least one attitude towards male partner violence (Time 1=21.3%; Time 2=21.9%; Time 3=20.2%; Time 4=19.6%), and approximately 38% of students reported perpetrating bullying at least one time in the past 30 days across all time points (Time 1=37.8%; Time 2=37.8%; Time 3=36.9%; Time 4=37.6%). Among daters at each time point, approximately 70% reported perpetrating at least one type of dating violence (Time 1=71.9%; Time 2=66.2%; Time 3=65.7%; Time 4=62.3%).

Tables 9 and 10, respectively, provides tetrachoric correlations among all study predictor, mediator, and outcome variables by females and males.

Measurement Model of Bullying Perpetration

Beginning with Time 1 data only and the full sample, a one factor model with the six categorical items was fit for bullying perpetration based on the factor structure determined by CDC *Dating Matters*® evaluation team. This model included three parceled indicators of

bullying perpetration. Though this model fit the data perfectly, the parcels were extremely skewed thus violating the assumptions for the utilization of MLR estimation in Mplus. For example, the range was 1-4 for all parcels and means for each were 1.19 (SD=.431), 1.22 (SD=.475), and 1.15 (SD=.412), indicating that a large majority of the responses were category 1 or never perpetrated bullying. Based on this distribution all items were collapsed to "never" or "1 or more times." As shown in Table 6, prevalence of bullying perpetration for each item was below 20% for Time 1. Based on this information instead of using parcels with binary items, all six binary items were used as indicators in the model (see Figure 5).

This model fit the data well, χ^2 (9) = 16.342, p = .06; CFI = .993; TLI = .989; RMSEA = .036, suggesting that the unidimensional latent bullying perpetration construct is supported. Overall, all six items were highly correlated with one another indicating convergent validity; tetrachoric correlations ranged from .515 to .721 for Time 1. An assessment of unstandardized and standardized factor loadings can be seen in Table 11. Standardized factor loadings were al significant and ranged from .741 to .850 at Time 1. The r-squared values for each item also indicated that the amount of item variance accounted for by the unidimensional bullying perpetration factor was high – range was .549 to .723. This model was then tested by sex, cohort, race/ethnicity, and over time.

Measurement Invariance Results. First, models were estimated separately for all groups (i.e., males and females; 6th and 7th grades; and the three racial categories) with only Time 1 data. Overall the model fit the data adequately for both sexes, cohorts, and all racial/ethnic groups (see Tables 12a-d) and unstandardized factor loadings appeared to be similar across both sexes (see Table 11). To test if any differences were statistically significant, several multi-group CFAs were estimated. In the multi-group model, I tested separate group-specific factor

structures, simultaneously by using the GROUPING IS function in Mplus to specify that models should be run for each grouping variable within the single framework. For each grouping variable, the configural model was specified with item factor loadings and thresholds freely estimated and the factor variance fixed at one and the factor mean fixed at zero for all groups.

As shown in Tables 12a, the configural invariance model had good fit (χ^2 (18) = 27.893, p = .0637; CFI = .991; TLI = .986; RMSEA = .042) for sex. To determine if the factor loadings across groups differed, a metric invariance model was specific by applying parameter equality constraints to the loadings across males and females. In this model, thresholds were freely estimated, and the factor variance was fixed to one in the female group but was freely estimated in the male group; the factor mean was fixed to zero in both groups. The metric invariance model did not fit significantly worse than the configural invariance model, χ^2 difference test (5) = 6.002, p = .306; ΔCFI = .001, and in fact, model fit improved (χ^2 (23) = 32.098, p = .0981; CFI = .992; ΔCFI = .001; TLI = .990; RMSEA = .036). Metric invariance in this model held indicating that the relationship between the items and the bullying perpetration factor were equivalent across males and females. However, to test if the item thresholds across groups are similar, we tested a scalar invariance model. In this model, all factor loadings are constrained to be equal and all thresholds are constrained to be equal across both males and females. In addition, the factor variance and mean were fixed to one and zero, respectively, in females, but the factor variance and mean were freely estimated for males. The full scalar invariance model did not fit significantly worse than the metric invariance model, χ^2 difference test (5) = 3.077, p = .688; ΔCFI = .001, and in fact, model fit improved (χ^2 (28) = 35.686, p = .1508; CFI = .993; ΔCFI = .001; TLI = .993; RMSEA = .030). Lastly, the full scalar model was tested against the configural model. The difference test demonstrated that the scalar model did not fit significantly

worse than the configural model (χ^2 difference test (10) = 9.952, p = .445; ΔCFI = .002). For cohort and race/ethnicity invariance testing, the same process outlined above was implemented. Results for bullying measurement invariance by cohort and race/ethnicity are presented in Tables 12b and 12c. All models had good model fit and passed scalar invariance testing.

A multi-group framework was not used to test invariance over time and instead the same factor structure was entered into a single model with all four time points. Similar to the invariance testing described above, the configural, metric, and scalar models were specified, but did not include a grouping variable (e.g., male and female). Models were specified such that items were correlated across time (e.g., item A at Time 1 was correlated with item A at Times 2, 3, and 4) and the unidimensional factor was correlated across time (e.g., Time 1 bullying perpetration latent with Time 2 bullying perpetration latent, etc.). The same steps to test the configural, metric, and scalar models were conducted as described above. For example, in the configural models all loadings and thresholds were freely estimated and the factor variance was fixed to one across time and the factor mean was fixed to zero across time. As shown in Table 12d, the configural invariance model had adequate fit (χ^2 (236) = 320.097, p = .0002; CFI = .985; TLI = .983; RMSEA = .018). The χ^2 was significant, but the CFI was above .95 and RMSEA was under .08. The metric invariance model did not fit significantly worse than the configural invariance model, χ^2 difference test (15) = 13.996, p = .5258; ΔCFI = .002, and model fit improved (χ^2 (251) = 323.500, p = .0014; CFI = .987; ΔCFI = .002; TLI = .986; RMSEA = .016). The full scalar invariance model also did not fit significantly worse than the metric invariance model, χ^2 difference test (15) = 23.175, p = .0805; ΔCFI = .000. Lastly, the full scalar model was tested against the configural model. The difference test demonstrated that the scalar model

did not fit significantly worse than the configural model (χ^2 difference test (30) = 31.980, p = .3685; ΔCFI = .002).

Measurement Model of Acceptance of Partner Violence

Beginning with Time 1 data only and the full sample, a two factor model with the four categorical items was fit for acceptance of partner violence based on the factor structure determined by CDC *Dating Matters*® evaluation team. However, as mentioned above, the structure for the CDC *Dating Matters*® models includes all 10 items, yet this dissertation only included the eight items that were specific to boyfriend/girlfriend partner violence. The model with the 10 items included three indicators for each subscale – acceptance of male partner violence and acceptance of female partner violence. Two of the three indicators were parceled with other items. Due to the removal of the two items, the original parceling technique could not be explored with this data. So, a two-factor CFA was fit with the four, four-level (e.g., strongly agree, agree, disagree, strongly disagree) categorical items. This model demonstrated borderline adequate fit to the data, χ^2 (19) = 170.055, $p < .001$; CFI = .951; TLI = .927; RMSEA = .076. However, when the configural models with several grouping variables (i.e., sex and cohort) were estimated, they did not converge. A closer examination of item distributions revealed very small cell sizes for the "agree" and "strongly agree" categories for acceptance of male partner violence, which prohibited the models from running properly (see Table 7). This is very likely due to less support (whether true or due to social desirability) for male violence perpetrated against a partner under any circumstance. Thus, to increase cell sizes item responses were collapsed to "strongly agree/agree" and "disagree/strongly disagree."

Using these binary items, the same two-factor CFA models as described above were estimated (see Figure 6). Unlike the first model, this model fit the data well, χ^2 (19) = 62.907, p

< .001; CFI = .994; TLI = .991; RMSEA = .056, suggesting that the two-factor acceptance of partner violence construct is supported. Using this model, measurement invariance was tested by sex, cohort, race/ethnicity and over time. Though scalar invariance was demonstrated across sexes, cohorts, and racial/ethnic groups, models over time would not converge properly. Based on these results, I determined the next course of action was the look at acceptance of male partner violence and acceptance of female partner violence separately. At Time 1, the models for acceptance of male partner violence demonstrated decent fit to the data (χ^2 (2) = 6.268, p = .044; CFI = .999; TLI = .998; RMSEA = .055) and the acceptance of female partner violence model demonstrated borderline adequate model fit (χ^2 (2) = 18.023, p < .001; CFI = .993; TLI = .978; RMSEA = .104).

Overall, all four acceptance of male violence items were correlated with one another; tetrachoric correlations ranged from .869 to .964 for Time 1. An assessment of unstandardized and standardized factor loadings can be seen in Table 13. Standardized factor loadings were all significant and ranged from .928 to .981 at Time 1. The r-squared values for each item also indicated that the amount of item variance accounted for by factor was high – range was .861 to .962. Overall, all four acceptance of female violence items were correlated with one another; tetrachoric correlations ranged from .666 to .831 for Time 1. An assessment of unstandardized and standardized factor loadings can be seen in Table 15. Standardized factor loadings were all significant and ranged from .801 to .898 at Time 1. The r-squared values for each item also indicated that the amount of item variance accounted for by factor was high – range was .642 to .807. Both models was then tested by sex, cohort, race/ethnicity, and over time.

Measurement Invariance Results. The same process as described above to determine bullying measurement invariance was implemented for acceptance of male and female partner

violence across all groups and over time. The results of invariance testing for acceptance of male partner violence are found in Tables 14a-d and results for acceptance of female partner violence are found in Tables 16a-d. All models supported scalar invariance indicating no differential functioning across the grouping variables or over time.

Measurement Model of Adolescent Dating Violence Perpetration

Beginning with Time 1 data on only the dating sample, a one factor ADV model with the five parceled indicators was fit using the structure determined by CDC *Dating Matters*® evaluation team, as described above. The original structure for the CDC *Dating Matters*® ADV model includes six parceled indicators; however, sexual dating violence perpetration was not assessed in this dissertation due to low base rates and small cell sizes. Based on the analyses by the CDC *Dating Matters*® team, I first transformed all items to three categories instead of four (i.e., never, seldom, and sometimes/often) and then parceled items at the means to develop five specific latent constructs (i.e., physical, relational, threatening, verbal abuse, and severe physical). This model indicated poor fit to the data, χ^2 (9) = 63.107, $p < .001$; CFI = .933; TLI = .888; RMSEA = .116. In addition to the poor fit, the parcels were extremely skewed thus violating the assumptions for the utilization of MLR estimation in Mplus. Based on the distributions, all items were collapsed to "never" or "at least seldom." As shown in Table 8, prevalence of ADV perpetration for most items were under 15% for Time 1 – items corresponding to verbal abuse had higher prevalence estimates (approximately 20-30%). Thus, items with the binary responses were summed to create an ordered-categorical indicator of each type of ADV (e.g., physical, verbal, etc.). Assessment of the distribution of the five, ordered-categorical indicators revealed a large majority of respondents fell into the "never" category.

Using these ordered-categorical indicators, the same one-factor CFA model as described above was estimated (see Figure 7). Unlike the model with continuous and three-level categorical items, this model fit the data well, χ^2 (5) = 12.715, p = .0262; CFI = .992; TLI = .985; RMSEA = .059, suggesting that the one-factor ADV construct is supported. Overall, all five indicators were correlated with one another; polychoric correlations ranged from .416 to .731 for Time 1. However, this model would not converge when testing configural measurement invariance by sex. Further assessment using the modification indices showed that correlating the residual variances for both relational and physical as well as relational and verbal could improve model convergence. The model including the correlated residual variances for both relational and physical as well as relational and verbal did, in fact, allow the model to converge and it fit the data very well, χ^2 (3) = 1.168, p = .7606; CFI = 1.000; TLI = 1.006; RMSEA = .000. An assessment of unstandardized and standardized factor loadings for this final model can be seen in Table 17. Standardized factor loadings were all significant and ranged from .781 to .894 at Time 1. The r-squared values for each item also indicated that the amount of item variance accounted for by factor was high – range was .425 to .715. This model was then tested by sex, cohort, race/ethnicity, and over time.

Measurement Invariance Results. The same process as described above to determine bullying and acceptance of partner violence measurement invariance was implemented for ADV across all groups and over time. The results of invariance testing for ADV perpetration are found in Tables 18a-d. Models assessing the invariance of cohort and over time passed scalar invariance indicating no differential functioning. However, models did not pass scalar invariance initially for sex and race/ethnicity.

As shown in Table 18a, the configural invariance model for sex had good fit (χ^2 (6) = 2.247, p = .8957; CFI = 1.000; TLI = 1.012; RMSEA = .000). To determine if the factor loadings across groups differed, a metric model was specific by applying parameter constraints to the loadings in males and females. The metric invariance model did not fit significantly worse than the configural invariance model, χ^2 difference test (4) = 1.852, p = .763; ΔCFI = .000. The full scalar invariance model did fit significantly worse than the metric invariance model, χ^2 difference test (16) = 36.243, p = .0027; ΔCFI = .02, and in fact, model fit worsened (χ^2 (26) = 41.172, p =.0298; CFI = .986; TLI = .989; RMSEA = .0527). The modification indices suggested that all three physical parcel thresholds in the female model contributed the largest amount to model misfit and should be freed. Specifically, inspection of the unstandardized thresholds indicated that males had much larger thresholds than females, thus males with the same factor value as females had higher expected physical item probability of endorsement than would be expected as compared to females. After allowing the thresholds in the female group to be freely estimated (and not equal to the male thresholds), the partial scalar invariance model had significantly better fit than the full metric invariance model, χ^2 difference test (13) = 21.006, p = .5807; ΔCFI = .000. Lastly, the partial scalar model was tested against the configural model. The difference test demonstrated that the partial scalar model did not fit significantly worse than the configural model (χ^2 difference test (17) = 17.370, p = .4296; ΔCFI = .000).

Unfortunately, when the configural measurement invariance model was estimated for race, it did not converge properly because the residual correlation between relational and physical was above one. Thus for the configural model, I removed the correlated residual for relational and physical, but kept in the correlated residual for relational and verbal. As shown in Table 18c, the configural invariance model had good fit (χ^2 (12) = 8.785, p = .7212; CFI = 1.000;

TLI = 1.006; RMSEA = .000). The metric invariance model did fit significantly worse than the configural invariance model, χ^2 difference test (8) = 24.1249, p = .0022; ΔCFI = .014, and model fit worsened (χ^2 (20) = 37.892, p = .0009; CFI = .986; TLI = .980; RMSEA = .078). The modification indices suggested that the loadings for physical and threatening ADV perpetration contributed the largest amount to model misfit and should be freed in one group. Specifically, the other race group had smaller factor loadings for both physical and threatening ADV than the Black and Hispanic groups. After freeing these factor loadings, the partial metric invariance model had significantly better fit than the full metric invariance model, χ^2 difference test (6) = 5.798, p = .4462; ΔCFI = .000. Building from the partial metric model, the partial scalar model freely estimated the loadings for physical and threatening ADV perpetration but also freed the associated thresholds with both these indicators in one group. This partial scalar invariance model did not fit significantly worse than the partial metric invariance model, χ^2 difference test (27) = 36.257, p = .1098; ΔCFI = .004. Lastly, the partial scalar model was tested against the configural model. The difference test demonstrated that the partial scalar model did not fit significantly worse than the configural model (χ^2 difference test (33) = 40.896, p = .1625; ΔCFI = .004).

Research Question One

As described above and listed in Table 1, Research Question One assesses the concurrent associations between bullying perpetration, acceptance of male and female partner violence, and adolescent dating violence perpetration at each time point. It was hypothesized that ADV perpetration would be positively associated with acceptance of male partner violence, acceptance of female partner violence, and bullying perpetration for both male and female students. It was also hypothesized that acceptance of male partner violence would be positively associated with

bullying perpetration for male students only, and acceptance of female partner violence would be positively associated with bullying perpetration for female students only.

Four separate models were specified for each of the four time points. Only the dating sample at each time point was used in these analyses (see Table 3). Paths were estimated for all possible relationships across all variables within a given time point for both male and female students and controlled for cohort, race/ethnicity, and site. Model fit at Time 1 (χ^2 (477) = 527.294, p = .0553, CFI = .966; TLI = .962; RMSEA = .022), Time 2 (χ^2 (477) = 517.727, p = .0961, CFI = .981; TLI = .979; RMSEA = .021), Time 3 (χ^2 (477) = 550.314, p = .0112, CFI = .978; TLI = .976; RMSEA = .024), and Time 4 (χ^2 (477) = 582.704, p = .0006, CFI = .966; TLI = .963; RMSEA = .035) indicated good fit. Unstandardized and standardized coefficients of structural correlation paths at each time point are provided in Table 19. Figure 8 displays all significant correlations across time for males and females.

Differences in Coefficients across Sex. The equality of coefficients across female and male students was examined at each time point to determine if any coefficients were significantly different from one another. At each time point, comparisons were made for all six covariances (e.g., female vs. male associations for Time 1 bullying and Time 1 ADV perpetration, etc.). A Bonferroni correction was applied such that the alpha level for significant was adjusted for multiple comparisons. The adjusted p-value was set at α/# of comparisons per time point (i.e., .05/6 or .008). Using the DIFFTEST option in Mplus, equality of coefficients across female and male students were examined to determine significant differences at p=.008. The Wald Test concluded that no unstandardized coefficients significantly differed for females and males across all time points. See Table 21 for the chi-square difference test results for Research Question One and Two.

Association between Bullying Perpetration and ADV Perpetration. Across both male and female students over time, bullying perpetration and ADV perpetration were significantly associated. The association was strongest for male students at Time 1 (r =.681; SE=.096; p < .001) and smallest, yet still moderate and highly significant, for females at Time 1 (r=.400; SE=.090; p < .001). Within wave associations for males and females were mostly comparable. Correlations for female students (r=.558; SE=.052; p < .001) and male students (r=.445; SE=.115; p < .001) at Time 2, along with correlations at Time 3 (female: r=.456; SE=.099; p < .001; male: r=.427; SE=.076; p < .001) and Time 4 (female: r=.422; SE=.100; p < .001; male: r=.532; SE=.084; p < .001) were moderate to large.

Association between Bullying Perpetration and Acceptance of Male Partner Violence. The association between bullying perpetration and male partner violence was somewhat consistent across sex and over time with the exception of Time 3. For example, the associations at Time 1 for female (r=.172; SE=.147; p = .243) and male students (r=-.036; SE=.139; p = .796) were small to negligible and non-significant; yet, associations for female (r=.386; SE=.155; p = .013) and male (r=.456; SE=.206; p = .027) students at Time 2 and Time 4 (female: r=.324; SE=.104; p = .002; male: r=.459; SE=.098; p < .001) were significant and moderate in strength of association. However, at Time 3, the association was significant only for female students (r=.230; SE=.116; p = .046). Male students at Time 3 had a small, non-significant correlation (r=.145; SE=.111; p = .189).

Association between Bullying Perpetration and Acceptance of Female Partner Violence. Similar to the associations between bullying perpetration and acceptance of male partner violence, some consistent associations emerged for both sexes and across time. For example, the associations at Time 1 for female (r=-.120; SE=.121; p = .320) and male students

(*r*=.006; SE=.083; *p* = .945) were small to negligible and non-significant. Associations for female (*r*=.254; SE=.115; *p* = .027) and male (*r*=.431; SE=.090; *p* < .001) students at Time 2 and Time 3 (female: *r*=.356; SE=.094; *p*< .001; male: *r*=.312; SE=.123; *p* = .012) were significant and moderate in strength of association. However, at Time 4, the association was significant only for male students (*r*=.326; SE=.102; *p* = .001). Female students at Time 4 had a small and marginal correlation (*r*=.244; SE=.126; *p* = .052).

Association between ADV Perpetration and Acceptance of Male Partner Violence. Acceptance of male partner violence was significantly associated with ADV perpetration in three of the four time points for females and two of the four time points for males. Consistently, associations for female (*r*=.239; SE=.103; *p* = .021) and male (*r*=.131; SE=.064; *p* = .041) students at Time 2 and Time 4 (female: *r*=.290; SE=.131; *p* = .027; male: *r*=.238; SE=.106; *p* = .024) were small, yet significant. At Time 1, associations were small for both female (*r* =.196; SE=.087; *p* = .025) and male students (*r* =.167; SE=.118; *p* = .155), but the association was only significant for female students. Associations were similar, yet not significant for female (*r* =.137; SE=.117; *p* = .241) and male (*r* =.305; SE=.157; *p* = .052) students at Time 3.

Association between ADV Perpetration and Acceptance of Female Partner Violence. The relationship between acceptance of female partner violence and ADV perpetration is consistent across females over time, but disparate across males and over time. At each time point, a significant and moderate association for females emerges (Time 1: *r* =.429; SE=.084; *p* < .001; Time 2: *r* =.392; SE=.073; *p* < .001; Time 3: *r*=.292; SE=.075; *p* < .001; Time 4: *r*=.378; SE=.069; *p* < .001), though the relationship for males is smaller, yet moderate and still significant for Time 2 (*r*=.338; SE=.102; *p* = .001) and Time 3 (*r*=.334; SE=.082; *p* < .001), and

marginal to non-significant for Time 1 (r =.201; SE=.103; p = .050) and Time 4 (r=.163; SE=.091; p = .074).

Association between Acceptance of Male Partner Violence and Acceptance of Female Partner Violence. Across both male and female students over time, the strongest significant associations emerged for acceptance of male and female partner violence. At Times 3 and 4, female (Time 3: r=.775; SE=.049; p < .001; Time 4: r=.680; SE=.079; p < .001) and male students (Time 3: r=.806; SE=.090; p < .001; Time 4: r=.751; SE=.077; p < .001) had very large associations at .68 or above. Though still significant, the strength of association across the sexes in both Time 1 and Time 2 are of interest. In Time 1, a moderate association appeared for females (r =.508; SE=.096; p < .001) though the association for males was much stronger (r =.771; SE=.064; p < .001). A similar relationship was seen for Time 2 whereby the association was much weaker for females (r=.496; SE=.096; p < .001) than for males (r =.811; SE=.063; p < .001).

Research Question Two

As described above and in Table 1, Research Question Two assesses the stability of the relationships across time points for bullying perpetration, acceptance of male and female partner violence, and adolescent dating violence perpetration. It was hypothesized that prior attitudes and behaviors would be positively associated with those same attitudes and behaviors at future time points. For example, does bullying at Time 1 predict bullying at Time 2 and so on. Four separate models were specified for each of the four variables – bullying perpetration, acceptance of male partner violence, acceptance of female partner violence, and ADV perpetration. The full sample across time was used for the models including bullying perpetration, acceptance of male partner violence, and acceptance of female partner violence; however, the sample of students

who ever dated and were not missing on variables for sex, race/ethnicity, and all CADRI items was used in the ADV perpetration models (see Table 3). Paths were estimated for the longitudinal relationships across each variable over time for both male and female students and controlling for cohort, race/ethnicity, and site. Models were first fit with across male and female students with each factor structure, over time, and with correlations for each item over (e.g., bullying item 1 at Time 1 with bullying item 1 at Time 2, Time 3 and Time 4). If necessary for model convergence, non-significant item correlations were trimmed. Models were also specified such that T+1 time point was regressed on T time point (e.g., bullying perpetration at Time 4 on bullying perpetration at Time 3, Time 2, and Time 1). Unstandardized and standardized coefficients of structural correlation paths across time are provided in Table 20. Figure 9 displays all significant regression coefficients over time for males and females within each construct.

Differences in Coefficients across Sex. Similar to Research Question One, the equality of coefficients across female and male students was examined for each construct across time to determine if any coefficients were significantly different from one another. For each construct, comparisons were made for all six correlations (e.g., female vs. male associations for Time 1 bullying and Time 2 bullying, etc.). A Bonferroni correction was applied such that the alpha level for significant was adjusted for multiple comparisons. The adjusted *p*-value was set at α/# of comparisons per time point (i.e., .05/6 or .008). Using the DIFFTEST option in Mplus, equality of coefficients across female and male students were examined to determine significant differences at p=.008. The Wald Test concluded that no unstandardized coefficients significantly differed for females and males across all time points. See Table 21 for the chi-square difference test results for Research Question One and Two.

Bullying perpetration stability over time. Model fit statistics indicated good fit to the data for bullying stability, χ^2 (745) = 814.656, p = .0385, CFI = .982; TLI = .981; RMSEA = .013). Across female and male students bullying from Time 1 to Time 3 was stable (see Table 20). Regression a coefficients predicting adjacent time points were the largest and most significant. For example, among females (β=.653; SE=.054; p < .001) and males (β=.510; SE=.099; p < .001) bullying perpetration at Time 1 significantly predicted bullying perpetration at Time 2. Similarly, among females (β=.474; SE=.094; p < .001) and males (β=.576; SE=.113; p < .001) bullying perpetration at Time 2 significantly predicted bullying perpetration at Time 3. However, this relationship among adjacent time points was not significant for Time 3 to Time 4 – for both females (β=.224; SE=.258; p = .385) and males (β=.264; SE=.208; p = .204). Stability of bullying behaviors across school years was not as consistently associated across both females and males. However, Time 2 moderately predicted Time 4 bullying for both females (β=.486; SE=.221; p = .028) and males (β=.562; SE=.168; p = .001). Nevertheless, Time 1 significantly predicted Time 3 bullying for females (β=.335; SE=.112; p = .003), but not for males (β=.205; SE=.109; p = .060) though it did not predict Time 4 for either females (β=.049; SE=.157; p = .757) or males (β=-.168; SE=.134; p = .209).

Acceptance of female partner violence stability over time. Model fit statistics indicated good fit to the data for stability of acceptance of female partner violence, χ^2 (321) = 412.844, p = .0004, CFI = .982; TLI = .976; RMSEA = .022). Among both sexes, acceptance of female violence was very stable over time. Consistently, adjacent time points were significantly, moderately associated among females (see Table 20). The strength of the association was similar across both males and females. Also consistent was the prediction of Time 2 to Time 4 for both females (β=.340; SE=.101; p = .001) and males (β=.366; SE=.090; p < .001). Still, there

were some inconsistent findings across the sexes. For example, Time 1 significantly predicted both Time 3 (β=.275; SE=.070; $p < .001$) and Time 4 (β=.193; SE=.072; $p = .007$) among females, but the coefficients were not significant for males (Time 1 to Time 3: β=.124; SE=.097; $p = .200$; Time 1 to Time 4: β=-.132; SE=.099; $p = .184$).

Acceptance of male partner violence stability over time. Model fit statistics indicated good fit to the data for stability of acceptance of male partner violence, χ^2 (370) = 379.513, $p = .3552$, CFI = .999; TLI = .999; RMSEA = .007). There was very little stability of acceptance of male partner violence over time across both female and male students. Among females and males (with one exception), prior acceptance of male partner violence did not significantly predict any future acceptance of male partner violence (see Table 20). For females, Time 1 did not significantly predict Time 2 (β=.205; SE=4.941; $p = .967$), Time 3 (β=.316; SE=2.841; $p = .911$), or Time 4 (β=.333; SE=3.023; $p = .912$). Acceptance of male violence at Time 2 did not significantly predict acceptance of male violence at Time 3 (β=.107; SE=1.828; $p = .953$) or Time 4 (β=.243; SE=4.150; $p = .953$). Acceptance of male violence at Time 3 also did not significantly predict acceptance of male violence at Time 4 (β=.207; SE=.144; $p = .150$). Similarly, among males, acceptance of male violence at Time 1 did not significantly predict acceptance of male violence at Time 2 (β=.155; SE=4.663; $p = .973$) or Time 3 (β=.441; SE=10.344; $p = .966$). Acceptance of male violence at Time 2 did not significantly predict acceptance of male violence at Time 3 (β=.197; SE=8.040; $p = .980$) or Time 4 (β=.192; SE=5.773; $p = .973$). Acceptance of male violence at Time 3 also did not significantly predict acceptance of male violence at Time 4 (β=.089; SE=2.109; $p = .966$). One significant relationship did emerge - Time 1 significantly predicted acceptance of male violence at Time 4 (β=.200; SE=.090; $p = .026$), but the association was weak.

Adolescent dating violence perpetration stability over time. Model fit statistics indicated adequate fit to the data for ADV perpetration, χ^2 (531) = 600.726, p = .0191, CFI = .973; TLI = .971; RMSEA = .018). Similar to previous results, adjacent time points exerted a larger effect than time points that spanned over a school year across both female and male students (see Table 20). Time 1 significantly predicted Time 2 (female: β=.595; SE=.061; p < .001; male: β=.664; SE=.080; p < .001), Time 2 significantly predicted Time 3 (female: β=.689; SE=.109; p < .001; male: β=.508; SE=.163; p = .002), and Time 3 significantly predicted Time 4, but only for females (β=.437; SE=.194; p = .024) and not males (β=.562; SE=.334; p = .092). The strength of these relationships were mostly moderate to strong. The relationship between Time 1 and Time 3 ADV was also not significant for female (β=.097; SE=.113; p = .393) or males (β=.214; SE=.201; p = .288). Some interesting and significant sex differences did emerge. For example, among females, ADV perpetration at Time 1 did not significantly predict ADV perpetration at Time 4 (β=.097; SE=.113; p = .393), yet among males, this relationship was significant and in an unexpected direction (β=-.968; SE=.140; p < .001). The inverse relationship between ADV perpetration at Time 1 and Time 3 is counter to expectation in that male students who reported ADV perpetration at Time 1 were *less* likely to report ADV perpetration at Time 4. Also, Time 2 did not significantly predict Time 4 ADV for females (β=.018; SE=.291; p = .950), but this relationship was significant and large for males (β=.853; SE=.298; p = .004).

Research Question Three

As mentioned previously before additional analyses, factor scores for all variables were saved from the models assessing the concurrent relationships among all variables. Estimated factor scores were then used to estimate a saturated model with all concurrent relationships

among variables, all auto-regressive paths, and cross-lagged paths for both males and females, simultaneously, using the multiple group function. These models also controlled for race/ethnicity, cohort, and site. Tables 22 and 23 lists all correlation and regression coefficients for females and males. Figure 10 depicts all significant structural paths including auto-regressive and cross-lagged for females and males – within-time paths are not included for ease of figure viewing.

Female model results. Among females, several significant within wave associations, and auto-regressive and cross-lagged paths remained while controlling for all other estimated paths and covariates in the model. Cohort was a significant predictor of both Time 2 ADV perpetration and Time 4 acceptance of female violence. Students in 7th grade reported more ADV perpetration (β=.-107; SE=.042; p = .010) and students in 6th grade reported more acceptance of female violence (β=.116; SE=.047; p = .014). Black students also reported more Time 2 (β=.160; SE=.066; p = .015) and Time 3 acceptance of male partner violence (β=.144; SE=.046; p = .002) as well as Time 3 acceptance of female partner violence (β=.154; SE=.042; p < .001) than non-Black students.

Similar to models estimated in Research Question One, among female students at Time 1 bullying perpetration (r=.674; SE=.042; p < .001), acceptance of male partner violence (r=.240; SE=.070; p = .001), and acceptance of female partner violence (r=.449; SE=.072; p < .001) were significantly associated with ADV perpetration. Acceptance of male and female partner violence were still significantly associated (r =.700; SE=.026; p < .001). Also bullying perpetration had no significant association with acceptance of female partner violence (p = .856), it was now significantly associated with acceptance of male partner violence (r =.183; SE=.080; p = .023).

At Times 2, 3, and 4, all significant relationships among variables remained from Research Question One models.

In models including all covariates and all other estimated paths, several auto-regressive relationships that emerged in Research Question Two became non-significant and vice versa among females. Similarly, bullying perpetration at Time 1 significantly predicted bullying perpetration at Time 2 (β=.308; SE=.150; $p = .040$) but it now was not a significant predictor of Time 3 ($p = .152$), and became a significant predictor of Time 4 (β=.664; SE=.164; $p < .001$). Consistently, bullying perpetration at Time 2 significantly predicted bullying perpetration at Time 3 (β=.467; SE=.118; $p < .001$), but did not significantly predict Time 4 ($p = .443$). Counter to the previous stability models, bullying perpetration at Time 3 significantly predicted bullying perpetration at Time 4 (β=.350; SE=.110; $p = .002$).

Also counter to previous models, acceptance of female violence at Time 1 did not significantly predict acceptance of female violence at Time 2 ($p = .955$), and it now predicted *decreases* in Time 3 (β=-.304; SE=.140; $p = .030$). Time 1 did not significantly predict Time 4 ($p = .720$). Also inconsistent was the findings that acceptance of female violence at Time 2 did not significantly predict acceptance of female violence at Time 3 ($p = .796$) or Time 4 (β=.722) and Time 3 did not significantly predict Time 4 ($p = .074$). In Research Question Two models, prior acceptance of male violence did not significantly predict any future acceptance of male violence norms. However, in revised models adjusting for all covariates and all estimated paths, significant relationships emerged. Time 1 significantly predicted Time 2 (β=.383; SE=.169; $p = .023$), Time 3 (β=.445; SE=.190; $p = .019$), but not Time 4 ($p = .092$). Acceptance of male violence at Time 2 did not significantly predict acceptance of male violence at Time 3 ($p = .071$) or Time 4 ($p = .177$). Finally, acceptance of male violence at Time 3 also did not significantly

predict acceptance of male violence at Time 4 (p = .758). ADV perpetration at Time 1 significantly predicted ADV perpetration at Time 2 (β=.428; SE=.157; p = .006), but not at Time 3 (p = .265). ADV at Time 1 predicted *decreases* in Time 4 ADV perpetration (β=-.281; SE=.096; p = .003). ADV perpetration at Time 2 significantly predicted ADV perpetration at Time 3 (β=.477; SE=.151; p = .002), but not Time 4 (p = .892). ADV perpetration at Time 3 did significantly predict ADV perpetration at Time 4 (β=.494; SE=.114; p < .001).

Several cross-lagged relationships were significant in female models. Consistent with my hypothesis bullying perpetration at Time 1 significantly predicted ADV perpetration at Time 4 (β=.289; SE=.106; p = .007); however, at no other time points did bullying perpetration significantly predict future ADV perpetration. Also consistent with hypotheses, acceptance of female partner violence at Time 1 significantly predicted ADV perpetration at Time 4 (β=.473; SE=.110; p < .001). Similar to the relationships seen with bullying and ADV perpetration, no additional direct, longitudinal relationships emerged for acceptance of female violence and ADV perpetration. Moreover, bullying perpetration at Time 1 significantly predicted both acceptance of male partner violence at Time 2 (β=.400; SE=.194; p = .039) and acceptance of female partner violence at Time 3 (β=.354; SE=.164; p = .031). Finally, several interesting cross-lagged relationships emerged that support the theory of cognitive dissonance[110] and self-perception theory[111] as described in Chapter 2. ADV perpetration at Time 2 predicted acceptance of female partner violence (β=.322; SE=.123; p = .009) and acceptance of male partner violence at Time 3 (β=.315; SE=.145; p = .030). ADV perpetration at Time 3 also predicted acceptance of female partner violence at Time 4 (β=.380; SE=.158; p = .061). Inconsistent with these positive relationships, ADV perpetration at Time 2 significantly predicted *decreases* in acceptance of female partner violence at Time 4 (β=-.470; SE=.220; p = .033). Finally, one additional

significant relationship appeared that was unexpected – Time 1 ADV perpetration significantly predicted *decreases* in Time 4 bullying perpetration (β=-.586; SE=.157; $p < .001$).

Male model results. Among males, several significant auto-regressive and cross-lagged relationships remained while controlling for all other estimated paths and covariates in the model. Similar to females, cohort and race predicted several variables. For example, 6th grade students reported less bullying perpetration at Time 4 (β=-.155; SE=.074; $p = .037$) and ADV perpetration at Time 4 (β=-.163; SE=.074; $p = .027$), but reported more acceptance of female partner violence at Time 2 (β=.140; SE=.069; $p = .042$). Race was a significant predictor of Time 2 ADV perpetration – Black students reported less ADV perpetration than non-Black students (β=-.090; SE=.038; $p = .018$). Dissimilar to female students, only minor differences arose in the significant concurrent relationships. At Time 1, 2 and 3, all relationships were significant, whereas in the models run for Research Question One, bullying perpetration was not associated with either acceptance of male or female partner violence at Time 1. Also, the significant relationships at Time 4 were consistently similar to those from the models run in Research Question One.

The auto-regressive relationships among variables over time also changed in models adjusting for all covariates and estimated paths for males. Unlike the finding in Research Question Two, bullying perpetration at Time 1 did not significantly predict bullying perpetration at Time 2 ($p = .413$) nor did it significantly predict Time 3 or 4 bullying perpetration ($p = .299$ and $p = .221$, respectively). Bullying perpetration at Time 2 did significantly predict bullying perpetration at Time 3 (β=.282; SE=.131; $p = .031$), which was consistent with previous models, however, it did not predict Time 4 bullying perpetration ($p = .532$). Bullying perpetration at Time 3 did not significantly predict bullying perpetration at Time 4 ($p = .321$).

Similar patterns were seen for both acceptance of male and female partner violence. Time 1 acceptance of female partner violence (β=.552; SE=.160; p = .001) and acceptance of male partner violence (β=-.429; SE=.207; p = .039) significantly predicted Time 2 acceptance of female partner violence and acceptance of male partner violence, respectively, but no other longitudinal associations emerged as significant. Of note, acceptance of male partner violence at Time 1 predicted *decreases* in acceptance of male partner violence at Time 2, which is counter to expectation. ADV perpetration at Time 1 remained a significant predictor of ADV perpetration at Time 2 (β=.679; SE=.157; p < .001), but no other time points. ADV perpetration at Time 2 remained a significant predictor of ADV perpetration at Time 3 (β=.864; SE=.229; p < .001) but no other time points. Lastly, ADV perpetration at Time 3 did significantly predict ADV perpetration at Time 4 (β=.429; SE=.192; p = .026), which did not emerge in previous models.

Several cross-lagged relationships were significant as well. Consistent with hypotheses, bullying and acceptance of both male and female partner violence significantly predicted future ADV perpetration; however, not in the expected directions. Bullying perpetration at Time 1 predicted significant *decreases* in ADV perpetration at Time 2 (β=-.209, SE=.098, p = .032) and bullying perpetration at Time 2 predicted significant *decreases* in ADV perpetration at Time 3 (β=-.239, SE=.116, p = .040). Similarly, acceptance of male partner violence at Time 1 predicted *decreases* in ADV perpetration at Time 2 (β=-.611, SE=.193, p = .002). Consistent with hypotheses, acceptance of female partner violence at Time 1 (β=.555, SE=.178, p = .002) and Time 2 (β=.612, SE=.283, p = .031) significantly predicted ADV perpetration at Time 2 and 4, respectively.

Similar to what was observed in the female models, ADV perpetration predicted bullying perpetration at future time points, although the relationships are counter to what was found in the

female models. ADV perpetration at Time 1 predicted *increases* in bullying perpetration at Time 2 (β=.505, SE=.111, $p < .001$) and ADV perpetration at Time 3 predicted *increases* in bullying perpetration at Time 4 (β=.400, SE=.160, $p = .012$). Also as hypothesized, acceptance of both male and female partner violence predicted future bullying perpetration, but in a direction counter to expectation. Time 1 acceptance of male partner violence predicted *decreases* in bullying perpetration at Time 2 (β=-.583, SE=.186, $p = .002$) and acceptance of male partner violence at Time 3 predicted *decreases* in bullying perpetration at Time 4 (β=-.678, SE=.249, $p = .007$). Though, Time 1 acceptance of female partner violence predicted the expected increases in bullying perpetration at Time 2 (β=.488, SE=.178, $p = .006$), Time 1 acceptance of female partner violence predicted *decreases* in bullying perpetration at Time 3 (β=-.461, SE=.140, $p = .001$). Consistent with observations in the female models, Time 1 ADV perpetration predicted both Time 2 acceptance of female partner violence (β=.303, SE=.121, $p = .012$) and Time 3 acceptance of male partner violence (β=.515, SE=.148, $p < .001$).

Comparing male and female models. Overall, the significant relationships that emerged were not consistent across both sexes. For females only, bullying at Time 1 significantly predicted Time 2 acceptance of male partner violence and Time 3 acceptance of female partner violence. Also bullying at Time 1 significant predicted increase in Time 4 ADV perpetration. On the other hand, for males, bullying at Time 1 and Time 2 predicted significant decreases in Time 2 and Time 3 ADV perpetration, respectively.

Also, in female models Time 1 acceptance of male partner violence predicted decreases in Time 3 acceptance of male partner violence, but this relationship was not present in male models and instead Time 1 acceptance of male partner violence only significant predicted decreases in Time 2 acceptance of male partner violence. Also in female models, acceptance of

male partner violence at any time point did not predict future behaviors or attitudes towards partner violence, whereas in male models. Time 1 acceptance of male partner violence significantly predicted decreases in Time 2 acceptance of female partner violence, Time 2 bullying perpetration, and Time 2 ADV perpetration. In addition, for males only, Time 3 acceptance of male partner violence predicted decreases in Time 4 bullying perpetration.

Similar discrepant findings emerged for acceptance of female partner violence path differences across males and females. For females, Time 1 acceptance of female partner violence predicted Time 2 and Time 3 acceptance of female partner violence, although for males Time 1 only predicted Time 2 and not Time 3. Likewise, Time 1 acceptance of partner violence among females predicted Time 3 acceptance of male partner violence and Time 4 ADV perpetration, but these relationships were not present for males. That said, in male models and not in female models. Time 1 acceptance of female partner violence did predict Time 2 acceptance of male partner violence and Time 2 ADV perpetration. In addition, for males only, Time 1 acceptance of female partner violence significantly predict increases in Time 2 bullying and decreases in Time 3 bullying. Lastly, in male models only, Time 2 acceptance of female partner violence predicted ADV perpetration at Time 4.

Finally, the relationships for ADV perpetration were also inconsistent across females and males. In female models, Time 1 ADV significantly predicted decreases in Time 4 bullying and Time 2 ADV significantly predicted decreases in Time 4 acceptance of male partner violence. However, among females only, Time 3 ADV perpetration predicted increase in Time 4 acceptance of male partner violence. Dissimilar from female models, Time 1 ADV among males significant predicted Time 2 acceptance of female violence, Time 2 bullying, and Time 3

acceptance of male partner violence. In addition, Time 3 ADV significant predicted Time 4 bullying, but only for males.

To better understand if the strength of parameters across male and female were significantly different from one another, I used the MODEL CONSTRAINT function in Mplus. First, new parameters for male and female auto-regressive and cross-lagged models were created. These parameters were the difference between a given male and female parameter estimate (e.g., New parameter = Female beta – Male beta). A trimming procedure was then used for model parsimony with the fewest parameters while still ensuring good model fit. Of the 72 new parameters created, 55 were not significant at $p > .05$ and were set to be equal (e.g., New parameter = Female beta – Male beta = 0). This model was compared to the full model with all parameters to determine if this model fit significantly worse. Using the difference in log likelihood test, this trimmed model was not significantly worse (χ^2 (72) = 88.915, $p = .085$). This resulted in keeping only 17 difference parameters in the models going forward. Table 24 provides a table of the significant difference parameters. Though six of the 17 difference parameters were significant indicating the cross-lagged parameter estimates were significantly different across male and female students, in the stratified models for both male and female students these estimates for not significant. For example, the model indicated that the parameters across male and female students was significantly different for the relationships between Time 1 bullying predicting Time 3 acceptance of male partner violence; however, the regression coefficients for male (β=-.144) and female (β=.361) were not significantly different from zero.

Research Question Four

Using the final model described above with all estimated concurrent, auto-regressive, and cross-lagged paths as well as the difference parameters and controlling for all covariates, the

MODEL INDIRECT function was utilized to determine if any indirect effects emerged. It was hypothesized that the relationship between bullying perpetration and adolescent dating violence perpetration will be partially mediated by acceptance of both male and female partner violence. Though I tested this specific indirect effect, I also tested all possible combinations of indirect effect (e.g., Time 1 bullying to Time 2 acceptance of male violence to Time 3 acceptance of female violence to Time 4 ADV). In Mplus, the direct effect, total effect and indirect effect are provided as well as specific indirect effects. The total effect is the sum of all direct and indirect paths and the indirect effect is the sum of all possible indirect effects specified in the model. Specific indirect effects are the indirect effect of a single path. So, it is possible for the indirect effect to be significant with no significant specific indirect path. Figure 11 displays the results of the significant specific indirect effects for males and females.

Results specific to the hypothesized paths (i.e., Time 1 acceptance of partner violence to Time 2 bullying perpetration to Time 3 ADV and Time 2 acceptance of partner violence to Time 3 bullying perpetration to Time 4 ADV) indicated no evidence of this relationship for males or females. For females, the direct effect of Time 1 bullying to Time 3 ADV was not significant (β=.042, SE=.100, p = .671) nor was the indirect effect (β=-.047, SE=.055, p = .395). The specific indirect effects for Time 1 bullying to Time 2 acceptance of male violence to Time 3 ADV (β=.013, SE=.029, p = .655) and Time 1 bullying to Time 2 acceptance of female violence to Time 3 ADV (β=-.032, SE=.030, p = .280) were also nonsignificant. For males, the direct effect of Time 1 bullying to Time 3 ADV was also not significant (β=.054, SE=.126, p = .669) nor was the indirect effect (β=-.036, SE=.047, p = .435). The specific indirect effects for Time 1 bullying to Time 2 acceptance of male violence to Time 3 ADV (β=.017, SE=.037, p = .653) and

Time 1 bullying to Time 2 acceptance of female violence to Time 3 ADV (β=-.029, SE=.029, p = .311) were also nonsignificant.

For females, the direct effect of Time 2 bullying to Time 4 ADV was not significant (β=.156, SE=.105, p = .137) nor was the indirect effect (β=.019, SE=.043, p = .653). The specific indirect effects for Time 2 bullying to Time 3 acceptance of male violence to Time 4 ADV (β=.016, SE=.018, p = .368) and Time 2 bullying to Time 3 acceptance of female violence to Time 4 ADV (β=-.004, SE=.014, p = .794) were also nonsignificant. However, for females the direct effect from Time 1 bullying perpetration to Time 4 ADV (β=.188, SE=.079, p = .017) and the total effect (β=.539, SE=.194, p = .006) were significant, but no indirect or specific indirect paths were significant.

For males, the direct effect of Time 2 bullying to Time 4 ADV was also not significant (β=.086, SE=.168, p = .609) nor was the indirect effect (β=.023, SE=.051, p = .657). The specific indirect effects for Time 2 bullying to Time 3 acceptance of male violence to Time 4 ADV (β=.020, SE=.023, p = .374) and Time 2 bullying to Time 3 acceptance of female violence to Time 4 ADV (β=-.005, SE=.018, p = .795) were also nonsignificant. Similar to females the direct effect from Time 1 bullying perpetration to Time 4 ADV was significant (β=.203, SE=.084, p = .016), but no indirect or specific indirect paths were significant.

Though the hypothesized directions were not significant, several notable relationships did emerge in the male and female models.

Female model results. Results from previous analyses indicated that the best predictor or future behavior was past behavior. This was particularly true for ADV perpetration and to some extent bullying perpetration for females. Though the direct effect of Time 1 ADV to Time 4 ADV (β=-.110, SE=.110, p = .317) and the total effect were not significant (β=.231, SE=.124, p

= .062), the indirect effect was significant (β=.341, SE=.105, p = .001). The specific indirect effect that was significant included the path from Time 1 ADV to Time 2 ADV to Time 3 ADV to Time 4 ADV (β=.137, SE=.043, p = .001). Similar patterns emerge for Time 1 ADV to Time 3 ADV and Time 2 ADV to Time 4 ADV. The direct effect of Time 1 ADV to Time 3 ADV (β=.218, SE=.131, p = .096) was not significant, but the total effect (β=.547, SE=.144, p < .001) and the indirect effect were significant (β=.329, SE=.076, p < .001). The specific indirect effect that was significant included the path from Time 1 ADV to Time 2 ADV to Time 3 ADV (β=.323, SE=.094, p = .001). The direct effect of Time 2 ADV to Time 4 ADV was not significant (β=.092, SE=.170, p = .589), but the total effect (β=.356, SE=.140, p = .011) and the indirect effect were significant (β=.264, SE=.068, p < .001). The specific indirect effect that was significant included the path from Time 2 ADV to Time 3 ADV to Time 4 ADV (β=.260, SE=.055, p < .001). I also found that Time 3 bullying partially mediated the relationship between Time 1 bullying and Time 4 bullying (β=.113, SE=.044, p = .010) though the indirect effect is not significant (β=.096, SE=.200, p = .193).

Two other significant indirect effects were found, but no direct effects or specific indirect effects were significant. For example, Time 1 ADV to Time 3 (β=.143, SE=.057, p = .012) and Time 4 bullying (β=.212, SE=.092, p = .021). Time 2 ADV also partially mediated several relationships. For example, the relationship between Time 1 acceptance of female partner violence and Time 3 ADV. The total effect (β=-.295, SE=.097, p = .002) and indirect effect were significant (β=-.165, SE=.066, p = .012). The specific indirect was also significant (β=-.120, SE=.057, p = .034). In addition, Time 2 ADV partially mediated the relationship between Time 1 ADV and Time 3 acceptance of female partner violence – the indirect (β=.097, SE=.043, p = .024) and specific effect (β=.119, SE=.050, p = .017) were both significant. Finally Time 2

ADV partially mediated the relationship between Time 1 ADV and Time 3 acceptance of male violence – the indirect (β=.098, SE=.049, p = .046) and specific effects were both significant (β=.154, SE=.066, p = .020), but no direct or total effects were significant.

Male model results. The direct effect of Time 1 ADV to Time 4 ADV was significant, which was not consistent with female models (β=-.416, SE=.207, p = .044), as well as the indirect effect (β=.319, SE=.109, p = .003). The specific indirect effect that was significant included the path from Time 1 ADV to Time 2 ADV to Time 3 ADV to Time 4 ADV (β=.103, SE=.041, p = .013). Similar patterns emerge for Time 1 ADV to Time 3 ADV and Time 2 ADV to Time 4 ADV. The direct effect of Time 1 ADV to Time 3 ADV was not significant (β=.226, SE=.164, p = .169), the indirect effect was significant (β=.277, SE=.092, p = .003). The specific indirect effect that was significant included the path from Time 1 ADV to Time 2 ADV to Time 3 ADV (β=.298, SE=.120, p = .013). The direct effect of Time 2 ADV to Time 4 ADV was also not significant (β=.265, SE=.240, p = .270), but the indirect effect was significant (β=.205, SE=.083, p = .013). The specific indirect effect that was significant included the path from Time 2 ADV to Time 3 ADV to Time 4 ADV (β=.201, SE=.077, p = .009). I also found that Time 2 bullying partially mediated the relationship between Time 1 bullying and Time 3 bullying (β=.109, SE=.055, p = .048) and the indirect effect (β=.193, SE=.068, p = .005) was significant. A significant indirect was found for Time 2 bullying to Time 4 bullying (β=.117, SE=.112, p = .001), but no direct, total, or specific indirect effect was significant.

Time 1 acceptance of female partner violence also demonstrated an indirect effect on Time 3 acceptance of female violence (β=.106, SE=.038, p = .005) with a significant specific effect (β=.087, SE=.040, p = .031) for Time 1 acceptance of female violence to Time 2 ADV to Time 3 acceptance of female violence. In several cases, a significant indirect effect was found

but no specific indirect effect was significant. For example, I found a significant indirect effect for Time 1 ADV to Time 3 acceptance of female partner violence (β=.107, SE=.039, p = .006), a significant direct effect (β=.486, SE=.106, p < .001) and total effect (β=.594, SE=.095, p < .001), but no significant specific indirect. I also found a significant indirect and direct effect, but no total effect or specific indirect effect - Time 1 ADV to Time 3 acceptance of male partner violence indirect effect (β=.049, SE=.025, p = .045) and direct effects were significant (β=.608, SE=.112, p < .001). Also in several cases, indirect effects were only significant – no total, direct or specific indirect. For example, the indirect effect of Time 2 bullying to Time 4 bullying (β=.117, SE=.059, p = .046), the indirect effect for Time 1 acceptance of male partner violence to Time 3 bullying (β=.186, SE=.085, p = .030), and the indirect effect for Time 1 acceptance of male partner violence to Time 3 acceptance of female partner violence (β=-.104, SE=.041, p = .011) were significant.

Finally, several significant specific indirect effects emerged as significant but no total, direct or indirect effects were significant. In addition, these findings were counter to expectation and in some cases, the complete opposite relationship as hypothesized. For example, Time 1 ADV predicted Time 3 acceptance of female partner violence that then predicted Time 4 bullying (β=.359, SE=.125, p = .004) as well as Time 1 ADV predicting Time 3 acceptance of male partner violence which then predicted Time 4 bullying (β=-.482, SE=.138, p < .001). I also found that Time 1 acceptance of male (β=-.093, SE=.044, p = .034) and female partner violence (β=.089, SE=.039, p = .023) predicted Time 2 ADV which then predicted Time 3 acceptance of male partner violence.

Research Question Five

Using only the 16 significant indirect paths, MODEL CONTRAST was used to determine if sex moderated the indirect effect. Five significant interaction effects were discovered. The indirect effect of Time 1 acceptance of female partner violence and Time 3 ADV via Time 2 ADV was moderated by sex (β=-.400, SE=.172, p = .020) indicating that the relationship was only significant for females. The indirect effect of Time 1 ADV and Time 4 bullying perpetration via Time 3 acceptance of female violence was moderated by sex (β=-.257, SE=.121, p = .033) indicating that the relationship was only significant for males. The indirect effect of Time 1 ADV and Time 4 bullying perpetration via Time 3 acceptance of male violence was moderated by sex (β=.354, SE=.121, p = .003) indicating that the relationship was only significant for males. The indirect effect of Time 1 acceptance of female partner violence and Time 3 acceptance of female partner violence via Time 2 ADV perpetration moderated by sex (β=-.152, SE=.065, p = .020) indicating that the relationship was only significant for males. Finally, the indirect effect of Time 1 acceptance of male partner violence and Time 3 acceptance of female partner violence via Time 2 ADV perpetration was moderated by sex (β=-.185, SE=.085, p = .029) indicating that the relationship was only significant for males.

Chapter V: Discussion

The aim of this dissertation is to assess both the concurrent and longitudinal auto-regressive and cross-lagged relationships between bullying perpetration, acceptance of male and female partner violence, and adolescent dating violence perpetration in middle school students who participated in CDC's cluster randomized controlled trial of the *Dating Matters®: Strategies to Promote Healthy Teen Relationships* Initiative. With multiple group longitudinal SEM, I was able to empirically test for sex differences in all relationships – whether cross-sectional, auto-regressive, or cross-lagged. Lastly, using this same framework, I was able to test if acceptance of partner violence indirectly influenced the relationship between bullying perpetration and adolescent dating violence perpetration with the full dating sample as well as male and female dating subsamples. My results were both consistent with and counter to previous literature and research.

Results stemming from Research Question One were partially supported. It was hypothesized that ADV perpetration would be positively associated with acceptance of male partner violence, acceptance of female partner violence, and bullying perpetration for both male and female students. I found that acceptance of male partner violence was positively associated with ADV perpetration in three of the four time points for females (Time 1, Time 2, Time 4) and two of the four time points for males (Time 2 and Time 4). Also acceptance of female partner violence was positively associated with ADV perpetration in all four time points for females and three of the four time points for males (Time 1, Time 2, and Time 3). These results corroborate previous results from cross-sectional studies linking attitudes accepting of partner violence to ADV perpetration;[8,47-49,72] however, my results demonstrate that the perpetrator of the violence (i.e., male partner violence vs. female partner violence) matters when considering these attitudes

as predictors of ADV perpetration. Only a small handful of studies have studied the acceptability of male versus female partner violence in sex-stratified analyses. Temple and colleagues[143] found that for males and females, both acceptability of female and male partner violence were significantly associated with both physical and psychological ADV. However, somewhat counter to my findings, Temple and colleagues found that, in sex-stratified results, acceptability of male partner violence had the strongest association with physical ADV among males, and acceptability of female partner violence had the strongest association with physical ADV among females.

It was also hypothesized in Research Question One that acceptance of male partner violence would be positively associated with bullying perpetration for male students only, and acceptance of female partner violence would be positively associated with bullying perpetration for female students only. Acceptance of male partner violence was positively associated with bullying perpetration in two of the four time points for males (Time 2 and Time 4). Unexpectedly, acceptance of male partner violence was also positively associated with bullying perpetration in three of the four time points for females (Time 2, Time 3, and Time 4). In addition, acceptance of female partner violence was positively associated with bullying perpetration in two of the four time points for females (Time 2 and Time 3). Similar to the unexpected findings above, acceptance of female partner violence was also positively associated with bullying perpetration in three of the four time points for males (Time 2, Time 3, and Time 4). Though my expectation that males endorsing male-perpetrated partner violence and females endorsing female-perpetrated partner violence would be associated with bullying perpetration within males and females, respectively, I did not expect the opposite to be true. Based on social desirability[8,60,61,65] it is possible that males under-reported their attitudes towards the acceptance

of male violence, but accurately reported their attitudes towards the acceptance of female violence thus deflating the true relationship between acceptance of male partner violence and bullying. In addition, there is evidence that males and females are generally more supportive of violence perpetrated by females, in any context, and this was supported in my results.[144]

Though not an explicit hypothesis, I also expected students who were accepting of male partner violence to be accepting of female partner violence. This was supported in the data for both males and females. Across all time points, acceptance of female partner violence and acceptance of male partner violence were significantly associated at $r > .5$. Correlations were strongest among males and remained significant across all four time points. This strong, positive correlations for acceptance of male and female partner violence have been demonstrated in studies by Temple and colleagues[143] and Price and colleagues[145] for both males and females; however estimates were moderate ($r > .3$ and $< .5$). The higher correlation in my study may be attributable to a more high-risk sample living in urban areas with high levels of crime and poverty.

Finally, at each of the four time points, the cross-sectional relationship between bullying perpetration and ADV perpetration was statistically significant for both male and female students, as hypothesized. Correlations were moderately large (all *r*s above .400 to .681). The strength of the association for males and females was not significantly different. These results are expected and consistent with previously studied links between bullying and adolescent dating violence.[4,22-29] However, these correlations are higher than found in previous research. For example, Niolon and colleagues[4] found a significant correlation of .2 for the association between verbal ADV perpetration and bullying perpetration for females – the correlation for all ADV sub-types and bullying perpetration was not significant for males. Also, Leadbeater and colleagues[26]

found associations less than .3 for the association between relational ADV perpetration and overt and relational bullying perpetration in a sample including both males and females – results were not stratified. The correlations I found were on average .5 for both males and females. As mentioned above, it may be possible that bullying perpetration and ADV perpetration are larger due to the high-risk sample. It's also possible that my sensitive measurement of ADV (e.g., asking multiple questions about multiple forms of TDV, asking only students who reported having dated) contributed to the larger correlation.

In Research Question Two, the stability of the relationships across time points for bullying perpetration, acceptance of male and female partner violence, and adolescent dating violence perpetration were analyzed. It was hypothesized that prior attitudes and behaviors would be positively associated with those same attitudes and behaviors at future time points (e.g., acceptance of male partner violence at Time 1 will be positively associated with Time 2, Time 3, and Time 4 reports of acceptance of male partner violence). Results indicate partial support for these hypotheses. Most interesting was that acceptance of male partner violence, for males and females, was not stable over time. Only one significant and small association emerged among males for Time 1 to Time 4. This suggests that attitudes accepting of male partner violence may be malleable and could be targeted and changed in prevention programs. In addition, it is possible that maturity and conforming to more traditional gender role norms also impacts this instability. That said, there is also a chance that the lack of significance in the stability of acceptance of male partner has to do with cell sizes. For example, in the full sample (i.e., not considering dating status and including both males and female), only 35 students agreed with "it is OK for a boy to hit his girlfriend if they insulted him in front of his friends "(see Table 7). Also interesting was that the most stable variable was acceptance of female partner violence

among females. Across time, prior acceptance of female partner violence predicted all future reports of acceptance of partner violence – in both adjacent time points and time points that spanned school years (e.g., Time 1 to Time 3; Time 1 to Time 4; Time 2 to Time 3; and Time 2 to Time 4). Because acceptance of female violence was significantly associated with ADV perpetration and bullying perpetration across both sexes, it may be an important variable for further examination.

Counter to expectations, bullying and ADV perpetration were not as stable as predicted for both males and females. The most stable relationship for bullying was Time 1 to Time 2 for males and females which responds to the two survey assessments in a school year (i.e., Fall to Spring). However, there was no stability from Time 3 to Time 4, which also corresponds to within school year assessments. The significance of only the adjacent time periods has been shown in the literature. For example, Espelage and colleagues[32] found that across 7 waves of data, prior wave bullying perpetration only predicted the future, adjacent wave for both males and females. Similar to the results for bullying, ADV was stable only at the adjacent time points for females. Research from Espelage and colleagues[32] also supports these findings. One interesting finding emerged among males: Time 1 ADV perpetration predicted significant (and large) decreases in Time 4 ADV. Though this finding is counter to expectation, it can be explained by the literature on the stability of dating relationships in middle school students. From multiple studies, we know that middle school dating relationships are short in duration (e.g., less than one year)[146,147] and perpetrators of ADV do not perpetrate in every relationship.[148,149] However, that may only explain the lack of stability and not necessarily that engaging in Time 1 ADV *decreased* Time 4 ADV. One of the limitations of these analyses (discussed in detail within the Limitations section), is small cell sizes across all variables, but

mostly in the ADV measurement particularly after sex stratification. For example, at Time 1 for males some items had less than 10 students endorsing that item.

Building on previous models, the models built in Research Question Three assessed were saturated with all concurrent relationships among variables (Research Question One), all auto-regressive paths (Research Question Two), and all possible cross-lagged paths for both males and females, simultaneously, using the multiple group function. Apart from the hypotheses already posited in Research Question One and Two, it was hypothesized that (1) more accepting attitudes towards male partner violence will predict bullying perpetration over time for male students only; (2) more accepting attitudes towards female partner violence will predict bullying perpetration over time for female students only; (3) more accepting attitudes towards male and female partner violence will predict adolescent dating violence perpetration over time for male and female students; and (4) bullying perpetration will predict adolescent dating violence perpetration over time for both male and female students. Results indicate partial support for these hypotheses.

In these saturated models, all but one correlation for males (Time 4 acceptance of female partner violence and Time 4 ADV perpetration) and two for females (Time 1 acceptance of female partner violence and Time 1 bullying; Time 4 acceptance of male partner violence and Time 4 ADV perpetration) were statistically significant when taking into account all other possible paths. In essence, the saturated model strengthened the relationship among variables within time point. This is likely due to increasing sample size. For example, the concurrent associations only used the dating sample at each wave (see Table 3), but the models in Research Question Three used the "ever-dated" sample and added a significant number of students to the analyses. These new significant relationships lend support to previous assertions that findings

inconsistent with hypotheses may be due to small cell sizes. Conversely, the saturated model diminished the stability estimates for most variables. For example, acceptance of female partner violence among females was extremely stable over the four waves in models that only considered a full sample (i.e., regardless of dating status) and did not include other variables. In the current saturated models, only Time 1 acceptance of female partner violence significantly predicted Time 2 acceptance of female partner violence in females. However, I did find consistent results for bullying stability in females and ADV perpetration in males and females.

Of interest in Research Question Three is the cross-lagged relationships which indicate the relationship between variables at adjacent time points and across school years. These relationships also account for both the concurrent relationships and auto-regressive relationships. My primary hypothesis was that bullying perpetration would predict future acceptance of partner violence, which would them predict future ADV perpetration. This was not supported in my data. As hypothesized, bullying perpetration at Time 1 did predict acceptance of male partner violence at Time 2 and ADV perpetration at Time 4, but only for females. Also for females, only acceptance of female partner violence at Time 1 (and not at a time point following bullying) predicted ADV perpetration at Time 4. However, for males, bullying perpetration at Times 1 and 2 predicted significant *decreases* in ADV perpetration at Times 2 and 3, respectively. Though the past literature linking bullying and ADV does not support this relationship,[30-36] this is one the first longitudinal study to use sex-stratified models to better understand this relationship. Espelage and colleagues[32] used sex-stratified models, but they only captured ADV in waves 6 and 7 when participants were in high school and did not capture any ADV in middle school. Therefore, it is possible that only controlling for sex, without explicitly looking at stratified models, does not accurately categorize this relationship as only being present only

among females. In addition, among males only, acceptance of female partner violence at Time 1 and Time 2 significantly predicted ADV perpetration at Time 2 and Time 4, respectively. On the other hand, acceptance of male partner violence at Time 1 predicted significant *decreases* in Time 2 ADV.

There are several other explanations of the significant, negative cross-lagged paths that emerged. First, these negative associations are not overall associations, but residualized associations because they take into account the stability of the variables over time. Partly what may be happening is that the negative cross-lagged associations indicate that the across-time association is not as large as we would expect because of the stable nature of these variables and the strong concurrent associations. One additional explanation could be related to the types of behaviors measured by the three scales for bullying, acceptance of violence, and ADV. The abbreviated version of the Illinois Bully Scale used in the *Dating Matters*® survey only captured verbal and relational bullying items, whereas all items in the acceptance of violence scale asked about attitudes towards acts of physical violence in certain circumstances and half of the ADV items captured physical (and severe physical) dating violence. It is possible that students who are verbally and relationally abusive to peers are not the same students who support and use physical violence against dating partners. Unfortunately, I could not unpack the ADV measure in this current study to determine if bullying (as operationalized with verbal and relational behaviors) was associated cross-sectionally and longitudinally with only certain types of ADV, such as only verbal, threatening or relational ADV. In fact, none of the seven longitudinal studies found significant associations when assessing the relationship between indirect bullying and direct ADV, or vice versa. For the most part these studies have focused on the relationship between physical bullying and physical ADV or composite variables of bullying and ADV that

include multiple types of behaviors for both measures. In addition, the acceptance of partner violence measure implemented did not include non-physical forms of violence. Lastly, it's also possible that these significant association are an artifacts of the dating sample - as opposed to full sample with non-daters, small cells sizes, and missing data (described in more detail in the Limitations section).

Several other interesting results emerged that were not explicitly tested but lend support to the theories of social information processing[100,109] and cognitive dissonance[110] as well as self-perception theory. [111] In both male and female models, ADV perpetration significantly predicted future attitudes accepting of partner violence. Specifically, among females, ADV perpetration at Time 2 significantly predicted attitudes accepting of both male and female partner violence at Time 3. Also, in males, ADV perpetration at Time 1 significantly predicted acceptance of male partner violence at Time 3. This is consistent with the theory of cognitive dissonance[110] and self-perception theory[111] that posits an individual develops normative beliefs based on their previous or current behaviors.

Also interesting, and unexpected, was the relationship between ADV at a given time point and future bullying behaviors. In males, Time 1 and Time 3 ADV perpetration significantly predicted Time 2 and Time 4 bullying, respectively. The positive relationship between Time 1 ADV and Time 2 bullying was surprising given that the relationship between Time 1 bullying and Time 2 ADV was negative. This indicates that the relationship between these variables across the two time points is reciprocal. The relationship from ADV to bullying in females was not significant, with one exception. Time 1 ADV perpetration significantly predicted *decreases* in Time 4 bullying perpetration. Besides some of the explanations for the negative cross-lagged relationships as listed above, it is possible that the dating sample itself

explains some of these findings. Again, as hypothesized and found in the literature, bullying should precede ADV because bullying and aggression can begin as early as elementary school whereas dating violence cannot begin until dating begins, which mostly commonly occurs in middle school.[150] However, because this sample was already dating in the 6th grade, it is possible that bullying did occur prior to ADV, but did so before middle school, which means their first engagement in bullying was not captured in the *Dating Matters*® survey. Therefore, in high risk samples such as those in the *Dating Matters*® survey, bullying should be studied in elementary school and before dating occurs to better understand the true nature of this relationship.

Research Question Four estimated all possible indirect effects including those that were hypothesized and those that were not. It was hypothesized that the relationship between bullying perpetration and adolescent dating violence perpetration would be partially mediated by acceptance of both male and female partner violence. My results did not support this hypothesis and only two indirect effects were consistent across the sexes; (1) the effect of Time 1 ADV on Time 4 ADV was via both Time 2 and Time 3 ADV; and (2) the effect of Time 2 ADV on Time 4 ADV was via Time 3 ADV. This lends support for the stability of dating violence across multiple time points. In Research Question Five, I tested whether or not sex moderated these two indirect effects, but found no significant moderation. Several other unexpected, yet significant, indirect paths did emerge for males and females. Among females, the effect of Time 1 ADV to Time 3 acceptance of female violence and Time 3 acceptance of male partner violence was mediated by Time 2 ADV. Among males, the indirect effect of Time 1 ADV on Time 4 bullying perpetration is via both Time 3 acceptance of male and female partner violence. Though all of these indirect relationships were unexpected, these results lend additional support to the theories of social information processing[100,109] and cognitive dissonance[110] as well as self-

perception theory[111] because ADV contributed to the development of these attitudes. Based on what I had found in Research Question Three, I was surprised to see no indirect paths from bullying to future ADV perpetration. With very little significance in cross-lagged paths (or findings that were counter to expectation), it seemed clear that the relationship between bullying and ADV was not as strong in this sample as was demonstrated in other longitudinal analyses.

For Research Question Five it was hypothesized that (1) the indirect effect of bullying perpetration and ADV perpetration via acceptance of male partner violence will be stronger for male than female students; and (2) the indirect effect of bullying perpetration and ADV perpetration via acceptance of female partner violence will be stronger for female than male students. This hypothesis was not supported. Even though several significant moderated indirect effects emerged, none of the significant indirect effects were consistent in male and female models.

Limitations

Several limitations are worth noting when considering these findings. First and foremost, the sample surveyed was part of a larger randomized controlled trial that specifically partnered with high-risk urban schools. Thus, my results may not be generalizable to other populations. Analyses should be replicated with data from youth in both urban and rural school systems to ensure these relationships do truly exist across all samples. In addition, my sample only includes students who were in 6th and 7th grade when they entered the study and does not include any 8th grade students. The exclusion of 8th grade students decreased my overall sample size, but also the sample of daters at each wave and over time. With these additional cases, issues that emerged in my measurement models (see below for more detail) may not have occurred. Third, active parental consent was required for three of the four sites and with low rates of return of

active parental consent forms, we cannot assume that the current sample is representative of all students attending the schools in the study. Also, it is possible that parents in households with high rates of violence were more likely to not return a consent form, which would contribute to any bias in our sample given the relationship between family violence and bullying[151] and dating violence.[152] There are also limitations of relying on self-report questionnaires and act-based measures that do not assess all types of violence and the context in which they occur. Our ADV measurement does not include any contextual information, thus we do not know if any of these incidents occurred in self-defense. Also, the measures of acceptance of partner violence do not produce much variability and few students reporting endorsement of partner violence, especially for male-to-female partner violence.

The ways in which I treated variables and my analytic approach, specifically for Research Questions Three, Four, and Five, can also be considered a slight limitation. Due to small cell sizes in response options across all bullying, acceptance of partner violence, and ADV items, I was forced to dichotomize these items and eliminate variability in responses. By design, these items were categorical in nature, but with several items may have approximated a continuous distribution. My dichotomization may have inadvertently removed information necessary to estimate significant relationships and paths. The structure of acceptance of partner violence is also somewhat problematic. The original structure, as determined by the *Dating Matters*® staff, includes the two subscales – male and female partner violence, yet in my study, these two factors were highly correlated and this high association may have impacted my results.

In addition, the use of factor scores, while supported in the literature[138,139] was not my first option for analytic technique. It was only because of model convergence issues that this plan B approach was implemented. Estimating the measurement model and structural paths

within the multiple-group framework for Research Questions Three, Four and Five were preferable because measurement error could be controlled for more accurately. Along the same lines, there are some drawbacks and criticism of cross-lagged panel designs.[153] These designs are often used to study causal influence with longitudinal data, but if variables are not stable over time the cross-lagged estimates included in the model may be flawed. For example, significant relationships that emerge may not be true relationships, the magnitude of the relationships may be inflated or lessened, and the sign of the influence may be incorrect (e.g., negative when it should be positive, etc.).[153]

Finally, limitations existed in the sample characteristics, attrition, and missing data over time. As mentioned, I relied on a dating sample because in order to answer the ADV questions, students were first asked if they had dated someone. If they had not, they were instructed to skip over the dating violence questions. For analyses at each wave, I used the currently dating sample at that wave but for the longitudinal models beginning in Research Question Three, I used a sample of "ever daters." So, my sample at each stage of my analyses was different. For example, some students who dated at Time 1, but not have reported dating at Time 2, 3 or 4, and while they were included in the "ever dater" sample, their responses for variables at Times 2, 3, and 4 were missing. Along the same lines, there was a reasonable amount of attrition of the sample and students coming in and out of schools over time. In the larger *Dating Matters®* sample that includes both comprehensive and standard of care students, approximately 45% of eligible students remained in the sample across school years and took surveys from Time 1 to Time 4. In future analyses of this data, a more sophisticated treatment of the missing data and data loss via attrition should be implemented such as a robust missing data imputation process.

Implications and Conclusions

Despite the fact that most of my hypotheses were not supported, my results do highlight some important considerations for violence prevention programming and policy. One striking finding is the number of middle school students who reported dating at a given time point and over time. Often dating violence prevention programming begins in high school or college,[154] but this may be well past the developmental time period in which dating violence behaviors begin. For example, at Time 1 76% of the sample had reported dating of which 60% were in 7th grade and 40% were in 6th grade. This increased to 85% in the second year of data collection. Not only are these youth dating early, but they are engaging in dating violence behaviors early as well. At Time 1, among the students who dated, 7th graders reported engaging on average 3.8 ADV acts and 6th graders reported 3.6 (out of 25 acts). Therefore, prevention programs should really target students prior to ADV engagement. That said, a majority of students did not engage in any ADV violence behaviors and would benefit from early prevention programs.

Because my findings in regard to the cross-lagged relationship between bullying and ADV are not consistent with the current research, additional analyses needs to be conducted to better understand and explain these findings. For example, future analyses could consider removing students at Time 1 whom have already begun dating or have already engaged in dating violence. By doing so, I would be able to better control for the timing of dating onset and could remove doubt as to when dating violence begins in middle school. Previous research has taken this approach for that exact reason.[33]

Even with insignificant or unexplainable negative relationships between bullying and ADV, dating violence intervention and prevention programs should be implemented early and should consider the prevention of co-occurring behaviors, such as bullying, and attitudes that increase the likelihood of engaging in behaviors. The concurrent relationships between these

variables were significant and moderate for both males and females, indicating that they are co-occurring in middle school students. Also, given the indirect path found in males that acceptance of partner violence predicted future acceptance of partner violence through ADV perpetration, it is clear that the prevention of acceptance of partner violence can reduce the likelihood of engaging in ADV. Dating violence prevention programs have in the past included explicit modules on changing attitudes towards the use of violence, no bullying programs have included such intervention content. Needless to say, my findings have implications for not only the timing of when to implement ADV prevention programming, but also for the content that should be included within adolescent dating violence programming and the individuals most at risk who should be targeted.

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Tables

Table 1. Research questions and associated hypotheses

Research Question	Hypothesis
1. Are there concurrent associations between acceptance of partner violence, bullying perpetration, and adolescent dating violence perpetration at each time point?	At all time points, acceptance of male partner violence will be positively associated with bullying perpetration for male students only.
	At all time points, acceptance of female partner violence will be positively associated with bullying perpetration for female students only.
	At all time points, acceptance of male partner violence will be positively associated with adolescent dating violence perpetration for both male and female students.
	At all time points, acceptance of female partner violence will be positively associated with adolescent dating violence perpetration for both male and female students.
	At all time points, bullying perpetration will be positively associated with adolescent dating violence perpetration for both male and female students.
2a. Does acceptance of male partner violence at Time T predict acceptance of male partner violence at Times T+1, T+2, and T+3?	Acceptance of male partner violence will be positively associated over time for male students only.
2b. Does acceptance of female partner violence at Time T predict acceptance of female partner violence at Times T+1, T+2, and T+3?	Acceptance of female partner violence will be positively associated over time for female students only.
2c. Does bullying perpetration at Time T predict bullying perpetration at Times T+1, T+2, and T+3?	Bullying perpetration will be positively associated over time for both male and female students.
2d. Does adolescent dating violence perpetration at Time T predict adolescent dating violence perpetration at Times T+1, T+2, and T+3?	Adolescent dating violence perpetration will be positively associated over time for both male and female students.
3a. Does acceptance of male partner violence at Time T predict bullying perpetration at Time T+1, T+2, and T+3?	More accepting attitudes towards male partner violence will predict bullying perpetration over time for male students only.
3b. Does acceptance of female partner violence at Time T predict bullying perpetration at Time T+1, T+2, and T+3?	More accepting attitudes towards female partner violence will predict bullying perpetration over time for female students only.

3c. Does acceptance of male partner violence at Time T predict adolescent dating violence perpetration at Time T+1, T+2, and T+3?	More accepting attitudes towards male partner violence will predict adolescent dating violence perpetration over time for male and female student.
3d. Does acceptance of female partner violence at Time T predict adolescent dating violence perpetration at Time T+1, T+2, and T+3?	More accepting attitudes towards female partner violence will predict adolescent dating violence perpetration over time for male and female students.
3e. Does bullying perpetration at Time T predict adolescent dating violence perpetration Time T+1, T+2, and T+3?	Bullying perpetration will predict adolescent dating violence perpetration over time for both male and female students.
4a. Does acceptance of male partner violence at Time 2 partially mediate the relationship between bullying perpetration at Time 1 and adolescent dating violence perpetration at Time 3?	The relationship between bullying perpetration and adolescent dating violence perpetration will be partially mediated by acceptance of both male and female partner violence.
4b. Does acceptance of female partner violence at Time 2 partially mediate the relationship between bullying perpetration at Time 1 and adolescent dating violence perpetration at Time 3?	
4c. Does acceptance of male partner violence at Time 3 partially mediate the relationship between bullying perpetration at Time 2 and adolescent dating violence perpetration at Time 4?	
4d. Does acceptance of female partner violence at Time 3 partially mediate the relationship between bullying perpetration at Time 2 and adolescent dating violence perpetration at Time 4?	
5. Does biological sex moderate the effect of acceptance of partner violence on the relationship between bullying perpetration and ADV perpetration across time?	The indirect effect of bullying perpetration and ADV perpetration via acceptance of male partner violence will be stronger for male than female students.
	The indirect effect of bullying perpetration and ADV perpetration via acceptance of female partner violence will be stronger for female than male students.

Table 2. Research studies documenting the relationship between bullying and adolescent dating violence

Authors (Year)	Final analytic sample size	Age/grade	Where recruited	Independent Variable(s)	Dependent Variable	Results
Ozer and colleagues (2004)	247	16-20 years at Time 1; 17-21 at Time 2	Selected randomly from the membership lists of a large health maintenance organization	Physical peer violence perpetration (PVP)	Physical dating violence perpetration (PDVP)	• For males, Time 1 PVP was significantly correlated with Time 2 PDVP (r = .32, p < .01). • For males, Time 1 PVP was not significantly correlated with Time 2 PDVP (r = .14, *ns*).
Foshee and colleagues (2014)	1154	11-12 years at Time 1; 13-14 years at Time 2	Three public school systems in rural North Carolina counties	Indirect bullying perpetration such as rumor spreading (IBP); Direct bullying perpetration such as hitting (DBP); Moderators included sex and race/ethnicity	Physical dating violence perpetration (PDVP)	• Time 1 IBP was significantly correlated with Time 2 PDVP (r = .08, p = .01). • Time 1 DBP was significantly correlated with Time 2 PDVP (r = .16, p < .001). • In models controlling for parent education, family structure, and family conflict, DBP significantly predicted PDVP (AOR = 1.36, p = .003). • No moderation was found for sex or race/ethnicity.
Foshee and colleagues (2015)	2414	13-15 at Time 1; 14-17 at Time 2	Three public school systems in rural North Carolina counties	Bulling perpetration (BP); bullying victimization (BV); Mediators included anger, depression, anxiety, and social status	Physical dating violence perpetration (PDVP)	• Time BP was significantly correlated with Time 2 PDVP (r = .04, p < .05). • Time 1 BV was not significantly correlated with Time 2 PDVP (r < .01, *ns*). • Time 1 BP only predicted Time 3 PDVP when there was no bullying

						victimization (b = 0.0303; p = .0296). • Time 1 anger mediated the association between Time 1 BP and PDVP at all levels of BV.
Orpinas and colleagues (2012)	550	6th grade at Time 1; 7th grade at Time 2; 8th grade at Time 3; 9th grade at Time 4; 10th grade at Time 5; 11th grade at Time 6; 12th grade at Time 7	Randomly selected from nine schools in Northeast Georgia	Bullying perpetration (BP); Bullying victimization (BV)	Psychological dating violence perpetration (PsyDVP); Psychological dating violence victimization (PsyDVV)	• Students in the high PsyDVV victimization/high PsyDVP group had the highest scores on BP and BV indicating that this group uses and experiences violence with both dating partners and peers.
Espelage and colleagues (2014)	1162	5th-7th grade at Time 1; 6-8th grade at Time 2; 6-8th grade at Time 3; 7th-9th grade at Time 4; 9th-11th grade at Time 5; 10th-12th grade at Time 6	Four Midwestern middle schools	Bullying perpetration (BP); Bullying victimization (BV)	Physical dating violence perpetration (PDVP); Psychological dating violence perpetration (PsyDVP); Relational dating violence perpetration (RDVP); Sexual dating violence perpetration (SDVP)	• For males, Time 6 BP significantly predicted Time 7 PDVP, PsyDVP, and SDVP. • For females, Time 6 BP significantly predicted Time 7 PsyDVP and SDVP.
Chiodo and colleagues (2011)	519	9th grade at Time 1; 11th grade at Time 2 *only females)	20 high schools participating as part of a cluster randomized controlled trial	Relational aggression perpetration (RAP)	Physical dating violence perpetration (PDVP); Physical dating violence victimization (PDVV)	• Females who reported both PDVP and PDVV at Time 2 had significantly higher mean scores on Time 1 RAP (M=2.01) than females with no reported dating violence (M=1.64).
Ellis and colleagues (2013)	589	9th-11th grade at Time 1 and Time 2 (6-month interval)	Two public high schools in a midsized Canadian city	Physical bullying perpetration (PBP); Relational aggression perpetration (RAP)	Dating violence perpetration (DVP); Dating violence victimization (DVV)	• Time 1 peer group RAP predicted Time 2 DVV and DVP. • Time 1 individual RAP predicted Time 2 DVP for females only.

Table 3. Sample size by research question

Research Question	**Final analytic sample size**	**Male**	**Female**
1a. Is there a concurrent association between acceptance of partner violence, bullying perpetration, and adolescent dating violence perpetration at Time 1?	429	227	202
1b. Is there a concurrent association between acceptance of partner violence, bullying perpetration, and adolescent dating violence perpetration at Time 2?	378	194	184
1c. Is there a concurrent association between acceptance of partner violence, bullying perpetration, and adolescent dating violence perpetration at Time 3?	514	259	255
1d. Is there a concurrent association between acceptance of partner violence, bullying perpetration, and adolescent dating violence perpetration at Time 4?	369	162	207
2a. Does acceptance of male partner violence at Time T predict acceptance of male partner violence at Times T+1, T+2, and T+3?	1179	542	637
2b. Does acceptance of female partner violence at Time T predict acceptance of female partner violence at Times T+1, T+2, and T+3?	1165	537	682
2c. Does bullying perpetration at Time T predict bullying perpetration at Times T+1, T+2, and T+3?	1105	504	601
2d. Does adolescent dating violence perpetration at Time T predict adolescent dating violence perpetration at Times T+1, T+2, and T+3?	848	427	421
3. Do norms and behaviors at Time T predict norms and behaviors at T+1, T+2, and T+3?	873	439	434
4. Does acceptance of partner violence at Time 2/Time 3 partially mediate the relationship between bullying at Time 1/Time 2 and ADV perpetration at Time 3/Time 4?	873	439	434
5. Does biological sex moderate the effect of acceptance of partner violence on the relationship between bullying and ADV perpetration across time?	873	439	434

Table 4. Comparison of dating sample and non-dating sample on socio-demographic characteristic

Variables	Total Sample *n* (%) (*n* = 1361)	Ever-dated sample *n* (%)[a] (*n* = 919)	Non-dating sample *n* (%) (*n* = 392)	$\chi 2$
Site				
Alameda	517 (38.0)	327 (35.6)	177 (45.2)	
Baltimore	291 (21.4)	213 (23.2)	62 (15.8)	
Broward	371 (27.3)	244 (26.6)	110 (28.1)	
Chicago	182 (13.3)	135 (14.7)	43 (11.0)	**16.68**
Grade				
Cohort 3 (6th grade)	637 (46.8)	405 (44.1)	207 (52.8)	
Cohort 2 (7th grade)	724 (53.2)	514 (55.9)	185 (47.2)	**8.43**
Sex[b]				
Male	641 (47.9)	458 (50.8)	160 (41.1)	
Female	697 (52.1)	444 (49.2)	229 (58.9)	**10.13**
Race/ethnicity[c]				
Non-Hispanic Black	653 (49.2)	476 (53.0)	151 (39.6)	**19.15**
Non-Hispanic White	52 (3.9)	32 (3.6)	15 (3.9)	.11
Hispanic	515 (38.8)	322 (35.9)	178 (46.7)	**13.25**
Non-Hispanic Other	47 (3.5)	22 (2.4)	25 (6.6)	**12.77**
Non-Hispanic Mixed	59 (4.4)	46 (5.1)	12 (3.1)	2.41

Notes. Significant relationships at $p < .01$ are shown in **boldface**.

[a] 50 students missing on dating question

[b] 23 students missing on sex variable

[c] 35 students missing on race and ethnicity variables

Table 5. Missing data patterns for the four time points

Pattern	Time 1	Time 2	Time 3	Time 4	N (%)
1	X				104 (7.6)
2		X			13 (1)
3			X		132 (9.7)
4				X	40 (2.9)
5	X	X			158 (11.6)
6	X		X		39 (2.9)
7	X			X	20 (1.5)
8		X	X		21 (1.5)
9		X		X	3 (.2)
10			X	X	165 (12.1)
11	X	X	X		159 (11.7)
12	X		X	X	86 (6.3)
13	X	X		X	48 (3.5)
14		X	X	X	42 (3.1)
15	X	X	X	X	331 (24.3)

Table 6. Descriptive statistics for bullying perpetration items over time

Item	**At least 1 time (N/%)**			
	Time 1	*Time 2*	*Time 3*	*Time 4*
I upset other students for the fun of it.	118 (19)	126 (23.4)	150 (22.4)	140 (24.2)
In a group I teased other students.	111 (18)	95 (17.8)	121 (18.2)	108 (18.8)
I helped harass other students.	53 (8.7)	53 (10)	76 (11.5)	52 (9.1)
I spread rumors about other students.	55 (9)	43 (8.1)	54 (8.2)	49 (8.7)
I started (instigated) arguments or conflicts.	89 (14.8)	86 (16.2)	95 (14.4)	81 (14.2)
I excluded other students from my clique of friends.	94 (15.7)	76 (14.6)	106 (16.3)	100 (17.8)

Table 7. Descriptive statistics for acceptance of partner violence items over time

Item	**Agree (N/%)**			
	Time 1	*Time 2*	*Time 3*	*Time 4*
It is OK for a girl to hit her boyfriend if he did something to make her mad.	257 (35.2)	185 (31)	238 (32.2)	168 (27.6)
It is OK for a girl to hit her boyfriend if he insulted her in front of friends.	247 (34.2)	158 (26.7)	218 (29.9)	144 (23.8)
Boys sometimes deserve to be hit by the girls they date.	272 (38)	181 (31)	244 (33.7)	170 (28.1)
A boy who makes his girlfriend jealous on purpose, deserves to be hit.	265 (37.2)	177 (30.4)	242 (33.3)	152 (25)
It is OK for a boy to hit his girlfriend if she did something to make him mad.	61 (8.5)	46 (8.1)	59 (8.2)	40 (6.7)
It is OK for a boy to hit his girlfriend if she insulted him in front of friends.	62 (8.7)	47 (8.2)	49 (6.8)	35 (5.9)
Girls sometimes deserve to be hit by the boys they date.	58 (8.1)	62 (10.9)	58 (8.1)	51 (8.6)
A girl who makes her boyfriend jealous on purpose, deserves to be hit.	66 (9.4)	53 (9.4)	63 (8.8)	43 (7.3)

Table 8. Descriptive statistics for adolescent dating violence perpetration items over time

Item	Facet	At least Seldom (N/%)			
		Time 1	*Time 2*	*Time 3*	*Time 4*
I tried to turn his/her friends against him/her.	Relational	29 (6.6)	15 (4.3)	18 (3.7)	13 (4)
I did something to make him/her feel jealous.	Verbal	174 (40.4)	131 (37.6)	173 (36)	115 (35.4)
I destroyed or threatened to destroy something he/she valued.	Threatening	22 (5.1)	22 (6.3)	34 (7)	21 (6.4)
I brought up something bad he/she had done in the past.	Verbal	118 (27.4)	95 (27.2)	128 (26.6)	88 (26.9)
I threw something at him/her.	Physical	67 (15.3)	64 (18)	105 (21.8)	69 (20.8)
I said things just to make him/her angry.	Verbal	133 (30.6)	103 (29)	171 (35.9)	103 (31.7)
I spoke to him/her in a hostile or mean tone of voice.	Verbal	137 (31.6)	83 (23.6)	118 (24.7)	77 (23.6)
I insulted him/her with put-downs.	Verbal	66 (15.4)	41 (11.7)	49 (10.3)	36 (11)
I said things to his/her friends about him/her to turn them against him/her.	Relational	21 (4.9)	12 (3.5)	10 (2.1)	8 (2.5)
I ridiculed or made fun of him/her/her in front of others.	Verbal	54 (12.8)	34 (9.8)	42 (9)	28 (8.6)
I kept track of who he/she was with and where he/she was.	Verbal	143 (33.9)	97 (28.2)	137 (29.1)	80 (24.8)
I blamed him/her/her for the problem.	Verbal	93 (21.5)	71 (20.9)	96 (20.6)	88 (27.1)
I kicked, hit, or punched him/her/her.	Physical	63 (14.7)	42 (12.4)	71 (15.3)	47 (14.6)
I accused him/her of flirting with another girl/guy.	Verbal	128 (30.1)	90 (26.5)	132 (28.6)	84 (26.1)
I deliberately tried to frighten him/her.	Threatening	40 (9.3)	22 (6.5)	24 (5.2)	22 (6.8)
I slapped him/her or pulled his/her hair.	Physical	44 (10.2)	37 (11.1)	77 (16.7)	32 (10)
I threatened to hurt him/her.	Threatening	15 (3.5)	17 (5.1)	21 (4.6)	19 (5.9)
I threatened to end the relationship.	Verbal	102 (24)	64 (19.3)	94 (20.5)	57 (17.9)
I threatened to hit him/her or throw something at him/her.	Threatening	25 (5.9)	18 (5.4)	39 (8.6)	27 (8.4)
I pushed, shoved, or shook him/her.	Physical	51 (12.1)	35 (10.5)	66 (14.4)	36 (11.3)
I spread rumors about him/her.	Relational	33 (7.8)	12 (3.6)	19 (4.2)	9 (2.8)
I threatened him/her with a knife or gun (including waving or pointing a knife).	Severe physical	7 (1.7)	4 (1.2)	9 (2)	3 (.9)
I choked him/her.	Severe physical	14 (3.3)	8 (2.4)	19 (4.2)	16 (5)
I used a knife or fired a gun.	Severe physical	11 (2.6)	8 (2.4)	9 (2)	7 (2.2)
I scratched him/her and/or bent his/her fingers.	Severe physical	36 (8.6)	23 (7)	40 (8.8)	20 (6.4)
I burned him/her/	Severe physical	4 (1)	1 (.3)	4 (.9)	2 (.6)
I bit him/her.	Severe physical	28 (6.7)	20 (6.1)	50 (11.2)	34 (10.8)

Table 9. Tetrachoric correlations among all study variables for females

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. T1 Bullying perp.	**.--**															
2. T1 Accept male violence	**.185**	**.--**														
3. T1 Accept fem violence	.017	**.709**	**.--**													
4. T1 ADV perp.	**.702**	**.235**	**.235**	**.--**												
5. T2 Bullying perp.	**.406**	**.**028	.037	**.376**	**.--**											
6. T2 Accept male violence	**.282**	**.203**	**.177**	**.189**	**.432**	**.--**										
7. T2 Accept fem violence	**.212**	**.260**	**.311**	**.211**	**.330**	**.753**	**.--**									
8. T2 ADV perp.	**.407**	.091	.106	**.476**	**.772**	**.386**	**.459**	**.--**								
9. T3 Bullying perp.	**.389**	.145	.118	**.373**	**.497**	.092	.104	**.497**	**.--**							
10. T3 Accept male violence	**.239**	.111	**.215**	**.227**	**.221**	**.215**	**.269**	**.295**	**.516**	**.--**						
11. T3 Accept fem violence	**.304**	**.166**	**.260**	**.300**	**.333**	**.230**	**.354**	**.426**	**.475**	**.913**	**.--**					
12. T3 ADV perp.	**.532**	.096	.017	**.507**	**.612**	**.206**	**.229**	**.683**	**.580**	**.382**	**.467**	**.--**				
13. T4 Bullying perp.	**.473**	.017	-.078	**.191**	**.482**	.164	.080	**.424**	**.555**	**.302**	**.275**	**.402**	**.--**			
14. T4 Accept male violence	.163	**.187**	**.325**	**.315**	.187	.118	.128	.121	**.363**	**.367**	**.317**	**.299**	**.347**	**.--**		
15. T4 Accept fem violence	.126	**.236**	**.350**	**.260**	**.355**	.161	**.247**	**.247**	**.400**	**.356**	**.380**	**.403**	**.344**	**.855**	**.--**	
16. T4 ADV perp.	**.360**	**.**128	.160	**.327**	**.535**	.115	.033	**.437**	**.376**	**.319**	**.357**	**.569**	**.585**	**.312**	**.481**	**.--**

Note: Significant correlations $p < .05$ are shown in **boldface**. Sample size for each correlation varies.

Table 10. Tetrachoric correlations among all variables for males

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. T1 Bullying perp.	**.--**															
2. T1 Accept male violence	**.191**	**.--**														
3. T1 Accept fem violence	**.222**	**.921**	**.--**													
4. T1 ADV perp.	**.801**	**.384**	**.354**	**.--**												
5. T2 Bullying perp.	**.315**	.050	.114	**.373**	**.--**											
6. T2 Accept male violence	.066	-.054	.003	.046	**.506**	**.--**										
7. T2 Accept fem violence	.134	-.001	.079	.151	**.532**	**.902**	**.--**									
8. T2 ADV perp**.**	**.350**	**.130**	**.198**	**.474**	**.678**	**.202**	**.480**	**.--**								
9. T3 Bullying perp.	**.361**	.020	-.008	**.385**	**.426**	**.122**	**.170**	**.389**	**.--**							
10. T3 Accept male violence	**.287**	.078	.061	**.433**	**.231**	.147	**.219**	**.360**	**.367**	**.--**						
11. T3 Accept fem violence	.205	.106	.084	**.342**	**.232**	.123	**.220**	**.343**	**.427**	**.922**	**.--**					
12. T3 ADV perp.	**.320**	.146	.149	**.477**	**.318**	.014	**.152**	**.565**	**.648**	**.493**	**.456**	**.--**				
13. T4 Bullying perp.	**.199**	.186	.174	.224	.211	-.050	.032	**.263**	**.377**	.041	**.395**	**.395**	**.--**			
14. T4 Accept male violence	.105	.288	.184	.277	.033	.101	.218	.238	.130	.119	.062	**.252**	**.472**	**.--**		
15. T4 Accept fem violence	.161	.262	.230	.205	-.051	.118	.224	.162	.048	.037	.068	.136	**.300**	**.841**	**.--**	
16. T4 ADV perp.	.069	.226	.240	.148	.158	-.056	.117	**.405**	**.311**	.107	.096	**.494**	**.703**	**.529**	**.272**	**.--**

Note: Significant correlations $p < .05$ are shown in **boldface**. Sample size for each correlation varies.

Table 11. Unstandardized and standardized factor loadings for bullying perpetration by sex over time

Time	Items	Full sample		Male		Female	
		Unstandardized factor loading estimate (s.e.)	**Standardized factor loading estimate (s.e.)**	**Unstandardized factor loading estimate (s.e.)**	**Standardized factor loading estimate (s.e.)**	**Unstandardized factor loading estimate (s.e.)**	**Standardized factor loading estimate (s.e.)**
T1	I upset other students for the fun of it.	1.000 (.000)	.776 (.043)	1.000 (.000)	.745 (.067)	1.000 (.000)	.800 (.054)
	In a group I teased other students.	1.096 (.084)	.850 (.039)	1.141 (.144)	.849 (.063)	1.066 (.094)	.853 (.048)
	I helped harass other students.	1.008 (.083)	.782 (.05)	.969 (.136)	.721 (.081)	1.044 (.105)	.835 (.063)
	I spread rumors about other students.	1.057 (.082)	.820 (.045)	1.059 (.134)	.788 (070)	1.065 (.099)	.852 (.057)
	I started (instigated) arguments or conflicts.	.955 (.074)	.741 (.047)	.932 (.124)	.694 (.074)	.966 (.089)	.772 (.061)
	I excluded other students from my clique of friends.	1.035 (.077)	.803 (.043)	1.200 (.125)	.894 (.053)	.926 (.100)	.741 (.065)
T2	I upset other students for the fun of it.	1.000 (.000)	.828 (.035)	1.000 (.000)	.835 (.054)	1.000 (.000)	.830 (.045)
	In a group I teased other students.	1.011 (.063)	.837 (.036)	1.085 (.088)	.906 (.037)	.913 (.092)	.757 (.064)
	I helped harass other students.	1.023 (.062)	.847 (.043)	1.051 (.085)	.877 (.052)	.976 (.091)	.810 (.069)
	I spread rumors about other students.	1.106 (.064)	.916 (.038)	1.070 (.096)	.893 (.060)	1.128 (.084)	.936 (.051)
	I started (instigated) arguments or conflicts.	.997 (.057)	.826 (.036)	1.061 (.077)	.886 (.036)	.945 (.081)	.784 (.059)
	I excluded other students from my clique of friends.	.999 (.058)	.827 (.038)	1.099 (.085)	.917 (.037)	.919 (.079)	.762 (.061)
T3	I upset other students for the fun of it.	1.000 (.000)	.850 (.029)	1.000 (.000)	.860 (.036)	1.000 (.000)	.844 (.045)
	In a group I teased other students.	1.022 (.051)	.869 (.029)	1.046 (.057)	.900 (.035)	.986 (.083)	.832 (.048)
	I helped harass other students.	.989 (.049)	.841 (.035)	.985 (.062)	.847 (.048)	.996 (.074)	.841 (.051)
	I spread rumors about other students.	1.038 (.053)	.883 (.037)	1.102 (.058)	.948 (.036)	.979 (.088)	.825 (.062)
	I started (instigated) arguments or conflicts.	.961 (.048)	.817 (.034)	1.003 (.061)	.862 (.042)	.935 (.074)	.789 (.051)
	I excluded other students from my clique of friends.	.950 (.046)	.808 (.034)	1.032 (.048)	.888 (.036)	.892 (.078)	.753 (.056)
T4	I upset other students for the fun of it.	1.000 (.000)	.860 (.029)	1.000 (.000)	.916 (.033)	1.000 (.000)	.816 (.044)
	In a group I teased other students.	1.015 (.049)	.873 (.029)	1.021 (.052)	.934 (.029)	.989 (.082)	.808 (.050)
	I helped harass other students.	1.021 (.054)	.879 (.037)	.909 (.066)	.832 (.056)	1.147 (.085)	.936 (.047)
	I spread rumors about other students.	.999 (.057)	.852 (.040)	.941 (.065)	.861 (.051)	1.053 (.086)	.860 (.055)
	I started (instigated) arguments or conflicts.	.959 (.049)	.825 (.038)	.975 (.050)	.893 (.040)	.950 (.082)	.776 (.058)
	I excluded other students from my clique of friends.	.960 (.049)	.826 (.034)	.976 (.052)	.894 (.039)	.967 (.078)	.790 (.051)

Table 12a. Measurement invariance by sex for bullying perpetration

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Sex												
Male	17	22.287	9	.0080	--	--	--	--	.974	--	.957	.072 (.035,.111)
Female	17	4.397	9	.8834	--	--	--	--	1.000	--	1.012	.000 (.000,.030)
Multi-group CFA												
Configural	24	27.893	18	.0637	--	--	--	--	.991	--	.986	.042 (.000,.072)
Metric	19	32.098	23	.0981	4.205	6.002	5	.3060	.992	.001	.990	.036 (.000,.063)
Scalar	14	35.686	28	.1508	3.588	3.077	5	.6882	.993	.001	.993	.030 (.000,.056)
Config. vs scalar	14	35.686	28	.1508	7.793	9.952	10	.4447	.993	.002	.993	.030 (.000,.056)

Table 12b. Measurement invariance by cohort for bullying perpetration

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Cohort												
6th	17	13.215	9	.1531	--	--	--	--	.993	--	.989	.040 (.000,.083)
7th	17	5.730	9	.7666	--	--	--	--	1.000	--	1.009	.000 (.000,.043)
Multi-group CFA												
Configural	24	19.131	18	.3838	--	--	--	--	.999	--	.998	.014 (.000,.053)
Metric	19	34.188	23	.0625	15.057	11.917	5	.0359	.991	-.008	.988	.039 (.000,.066)
Scalar	14	41.207	28	.0514	7.019	7.219	5	.2049	.989	-.002	.988	.039 (.000,.063)
Config. vs scalar	14	41.207	28	.0514	22.076	20.005	10	.0292	.989	-.010	.988	.039 (.000,.063)

Table 12c. Measurement invariance by race for bullying perpetration

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Race												
Hispanic	12	8.244	9	.5097					1.00	--	1.003	.000 (.000,.062)
Black, nh	12	12.741	9	.1747	--	--	--	--	.992	--	.987	.042 (.000,.091)
Other, nh	12	8.116	9	.5225	--	--	--	--	1.000	--	1.006	.000 (.000,.106)
Multi-group CFA												
Configural	36	28.997	27	.3611	--	--	--	--	.998	--	.997	.019 (.000,.059)
Metric	26	38.009	37	.4232	9.012	9.697	10	.4675	.999	.001	.999	.011 (.000,.051)
Scalar	16	47.421	47	.4554	9.412	9.150	10	.5179	1.00	.001	1.000	.007 (.000,.046)
Config. vs scalar	16	47.421	47	.4554	18.424	19.085	20	.5163	1.00	.000	1.000	.007 (.000,.046)

Table 12d. Measurement invariance over time for bullying perpetration

Model	**# para.**	**χ^2**	**df**	***p*-value**	**$\Delta\chi^2$**	**χ^2 diff. test**	**diff. test df**	***p*-value**	**CFI**	**ΔCFI**	**TLI**	**RMSEA (95% CI)**
Time												
Fall 2012	12	16.342	9	.0601	--	--	--	--	.993	--	.989	.036 (.000,.064)
Spring 2013	12	20.121	9	.0172	--	--	--	--	.993	--	.988	.048 (.019,.076)
Fall 2013	12	44.363	9	<.0001	--	--	--	--	.982	--	.969	.076 (.055,.099)
Spring 2014	12	22.231	9	.0082	--	--	--	--	.993	--	.988	.050 (.024,.077)
All timepoints combined												
Configural	64	320.097	236	.0002	--	--	--	--	.985	--	.983	.018 (.012,.022)
Metric	49	323.500	251	.0014	3.403	13.996	15	.5258	.987	.002	.986	.016 (.010,.021)
Scalar	34	343.097	266	.0010	19.597	23.175	15	.0805	.987	.000	.986	.016 (.010,.021)
Config vs scalar	34	343.097	266	.0010	23.000	31.980	30	.3685	.987	.002	.986	.016 (.010,.021)

Table 13. Unstandardized and standardized factor loadings for acceptance of male partner violence by sex over time

Time	Items	Full sample		Male		Female	
		Unstandardized factor loading estimate (s.e.)	**Standardized factor loading estimate (s.e.)**	**Unstandardized factor loading estimate (s.e.)**	**Standardized factor loading estimate (s.e.)**	**Unstandardized factor loading estimate (s.e.)**	**Standardized factor loading estimate (s.e.)**
T1	It is OK for a boy to hit his girlfriend if she did something to make him mad	1.000 (.000)	.981 (.012)	1.000 (.000)	.984 (.012)	1.000 (.000)	.973 (.028)
	It is OK for a boy to hit his girlfriend if she insulted him in front of friends	.873 (.433)	.975 (.013)	.997 (.023)	.981 (.016)	.994 (.048)	.967 (.026)
	Girls sometimes deserve to be hit by the boys they date	.494 (.184)	.929 (.023)	.966 (.025)	.950 (.023)	.939 (.051)	.913 (.044)
	A girl who makes her boyfriend jealous on purpose, deserves to be hit	.543 (.192)	.939 (.020)	.956 (.027)	.940 (.027)	.961 (.039)	.935 (.031)
T2	It is OK for a boy to hit his girlfriend if she did something to make him mad	1.000 (.000)	.960 (.011)	1.000 (.000)	.977 (.020)	1.000 (.000)	.999 (.015)
	It is OK for a boy to hit his girlfriend if she insulted him in front of friends	1.437 (.713)	.980 (.014)	.855 (.566)	.968 (.023)	.909 (.049)	.916 (.041)
	Girls sometimes deserve to be hit by the boys they date	.795 (.223)	.938 (.021)	.818 (.372)	.966 (.020)	.878 (.047)	.885 (.046)
	A girl who makes her boyfriend jealous on purpose, deserves to be hit	.821 (.234)	.942 (.021)	.792 (.420)	.963 (.025)	.915 (.037)	.922 (.034)
T3	It is OK for a boy to hit his girlfriend if she did something to make him mad	1.000 (.000)	.973 (.013)	1.000 (.000)	.994 (.010)	1.000 (.000)	.939 (.028)
	It is OK for a boy to hit his girlfriend if she insulted him in front of friends	2.551 (2.980)	.996 (.009)	1.005 (.018)	.998 (.010)	1.070 (.039)	.999 (.017)
	Girls sometimes deserve to be hit by the boys they date	.664 (.189)	.942 (.020)	.955 (.029)	.949 (.026)	.994 (.039)	.933 (.029)
	A girl who makes her boyfriend jealous on purpose, deserves to be hit	.892 (.231)	.967 (.013)	.966 (.021)	.960 (.020)	1.025 (.033)	.962 (.019)
T4	It is OK for a boy to hit his girlfriend if she did something to make him mad	1.000 (.000)	.948 (.021)	1.000 (.000)	.986 (.012)	1.000 (.000)	.874 (.058)
	It is OK for a boy to hit his girlfriend if she insulted him in front of friends	1.921 (1.218)	.985 (.016)	1.001 (.021)	.986 (.015)	1.126 (.086)	.983 (.039)
	Girls sometimes deserve to be hit by the boys they date	.916 (.235)	.939 (.021)	.969 (.027)	.955 (.026)	1.069 (.070)	.934 (.030)
	A girl who makes her boyfriend jealous on purpose, deserves to be hit	1.071 (.324)	.955 (.020)	.992 (.023)	.978 (.019)	1.047 (.077)	.915 (.042)

Table 14a. Measurement invariance by sex for acceptance of male partner violence

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Sex												
Male	8	1.5231	2	.4650	--	--	--	--	1.000	--	1.000	.000 (.000,.103)
Female	8	6.783	2	.0337	--	--	--	--	.998	--	.993	.079 (.019,.148)
Multi-group CFA												
Configural	16	8.623	4	.0713	--	--	--	--	.999	--	.998	.057 (.000,.111)
Metric	13	8.556	7	.2861	-.067	.435	3	.9329	1.000	.001	1.000	.025 (.000,.073)
Scalar	10	12.840	10	.2328	4.284	4.737	3	.1921	1.000	.000	.999	.028 (.000,.068)
Config vs scalar	10	12.840	10	.2328	4.217	4.015	6	.6746	1.000	.001	.999	.028 (.000,.068)

Table 14b. Measurement invariance by cohort for acceptance of male partner violence

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Cohort												
6th	8	7.057	2	.0293	--	--	--	--	.999	--	.997	.088 (.024,.163)
7th	8	.600	2	.7409	--	--	--	--	1.000	--	1.001	.000 (.000,.070)
Multi-group CFA												
Configural	16	10.266	4	.0362	--	--	--	--	.999	--	.998	.066 (.015,.117)
Metric	13	12.617	7	.0820	2.351	3.117	3	.3739	.999	.000	.999	.047 (.000,.089)
Scalar	10	14.877	10	.1366	2.260	.667	3	.8810	.999	.000	.999	.037 (.000,.074)
Config. vs scalar	10	14.877	10	.1366	4.611	4.806	6	.5689	.999	.000	.999	.037 (.000,.074)

Table 14c. Measurement invariance by race for acceptance of male partner violence

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Race												
Hispanic	8	6.369	2	.0414	--	--	--	--	.997	--	.992	.082 (.014,.157)
Black, non-Hispanic	8	.928	2	.6288	--	--	--	--	1.000	--	1.001	.000 (.000,.095)
Other, non-Hispanic	8	2.948	2	.2291	--	--	--	--	.996	--	.987	.066 (.000,.213)
Multi-group CFA												
Configural	24	7.505	6	.2767	--	--	--	--	1.000	--	.999	.032 (.000,.095)
Metric	18	8.281	12	.7628	.776	2.584	6	.8590	1.000	.000	1.001	.000 (.000,.046)
Scalar	12	14.539	19	.6934	6.258	7.204	6	.3024	1.000	.000	1.001	.000 (.000,.046)
Config. vs scalar	12	14.539	19	.6934	7.034	8.235	12	.7665	1.000	.000	1.001	.000 (.000,.046)

Table 14d. Measurement invariance over time for acceptance of male partner violence

Model	**# para.**	**χ^2**	**df**	***p*-value**	**$\Delta\chi^2$**	**χ^2 diff. test**	**diff. test df**	***p*-value**	**CFI**	**ΔCFI**	**TLI**	**RMSEA (95% CI)**
Time												
Fall 2012	8	6.268	2	.0435	--	--	--	--	.999	--	.998	.055 (.008,.105)
Spring 2013	8	7.373	2	.0251	--	--	--	--	.999	--	.996	.068 (.021,.124)
Fall 2013	8	1.801	2	.4065	--	--	--	--	1.000	--	1.000	.000 (.000,.071)
Spring 2014	8	5.102	2	.0780	--	--	--	--	.999	--	.998	.051 (.000,.108)
All timepoints combined												
Configural	38	107.482	98	.2408	--	--	--	--	.999	--	.999	.009 (.000,.018)
Metric	29	113.494	107	.3154	6.012	5.042	9	.8306	1.000	.001	1.000	.007 (.000,.017)
Scalar	20	124.405	116	.2801	10.911	13.611	9	.1369	.999	-.001	.999	.008 (.000,.017)
Config vs scalar	20	124.405	116	.2801	16.923	15.882	18	.6007	.999	.000	.999	.008 (.000,.017)

Table 15. Unstandardized and standardized factor loadings for acceptance of female partner violence by sex over time

Time	Items	Full sample		Male		Female	
		Unstandardized factor loading estimate (s.e.)	**Standardized factor loading estimate (s.e.)**	**Unstandardized factor loading estimate (s.e.)**	**Standardized factor loading estimate (s.e.)**	**Unstandardized factor loading estimate (s.e.)**	**Standardized factor loading estimate (s.e.)**
T1	It is OK for a girl to hit her boyfriend if he did something to make her mad	1.000 (.000)	.898 (.023)	1.000 (.000)	.910 (.036)	1.000 (.000)	.885 (.031)
	It is OK for a girl to hit her boyfriend if he insulted her in front of friends	.925 (.184)	.884 (.024)	.999 (.065)	.909 (.035)	.967 (.053)	.856 (.034)
	Boys sometimes deserve to be hit by the girls they date	.655 (.107)	.801 (.030)	.841 (.062)	.765 (.049)	.930 (.052)	.823 (.038)
	A boy who makes his girlfriend jealous on purpose, deserves to be hit	.760 (.129)	.840 (.027)	.859 (.062)	.781 (.048)	.997 (.049)	.882 (.031)
T2	It is OK for a girl to hit her boyfriend if he did something to make her mad	1.000 (.000)	.902 (.023)	1.000 (.000)	.933 (.029)	1.000 (.000)	.862 (.038)
	It is OK for a girl to hit her boyfriend if he insulted her in front of friends	1.237 (.291)	.932 (.020)	1.028 (.047)	.959 (.023)	1.049 (.062)	.904 (.034)
	Boys sometimes deserve to be hit by the girls they date	.738 (.127)	.838 (.030)	.876 (.053)	.817 (.046)	1.013 (.063)	.872 (.040)
	A boy who makes his girlfriend jealous on purpose, deserves to be hit	.874 (.154)	.877 (.026)	.921 (.048)	.860 (.039)	1.036 (.060)	.893 (.036)
T3	It is OK for a girl to hit her boyfriend if he did something to make her mad	1.000 (.000)	.924 (.020)	1.000 (.000)	.963 (.021)	1.000 (.000)	.879 (.035)
	It is OK for a girl to hit her boyfriend if he insulted her in front of friends	.900 (.202)	.908 (.021)	.988 (.039)	.952 (.023)	.977 (.061)	.859 (.037)
	Boys sometimes deserve to be hit by the girls they date	.659 (.118)	.847 (.026)	.866 (.043)	.834 (.039)	.990 (.058)	.870 (.037)
	A boy who makes his girlfriend jealous on purpose, deserves to be hit	.611 (.107)	.828 (.027)	.872 (.042)	.840 (.037)	.919 (.058)	.807 (.042)
T4	It is OK for a girl to hit her boyfriend if he did something to make her mad	1.000 (.000)	.903 (.024)	1.000 (.000)	.944 (.026)	1.000 (.000)	.873 (.036)
	It is OK for a girl to hit her boyfriend if he insulted her in front of friends	1.281 (.321)	.937 (.020)	.992 (.047)	.937 (.029)	1.078 (.060)	.941 (.026)
	Boys sometimes deserve to be hit by the girls they date	.968 (.188)	.897 (.024)	.948 (.044)	.895 (.035)	1.019 (.057)	.889 (.032)
	A boy who makes his girlfriend jealous on purpose, deserves to be hit	.990 (.184)	.901 (.023)	.915 (.049)	.864 (.042)	1.063 (.050)	.928 (.027)

Table 16a. Measurement invariance by sex for acceptance of female partner violence

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Sex												
Male	8	7.027	2	.0298	--	--	--	--	.995	--	.984	.088 (.024,.163)
Female	8	7.509	2	.0234	--	--	--	--	.995	--	.986	.083 (.026,.151)
Multi-group CFA												
Configural	16	14.539	4	.0058	--	--	--	--	.995	--	.985	.085 (.041,.135)
Metric	13	20.090	7	.0054	5.551	6.323	3	.0969	.994	-.001	.990	.072 (.036,.110)
Scalar	10	24.219	10	.0070	4.129	3.170	3	.3662	.993	-.001	.992	.063 (.031,.095)
Config vs scalar	10	24.219	10	.0070	9.680	10.067	6	.1218	.993	-.002	.992	.063 (.031,.095)

Table 16b. Measurement invariance by cohort for acceptance of female partner violence

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Cohort												
6th	8	12.342	2	.0021	--	--	--	--	.993	--	.978	.125 (.064,.195)
7th	8	6.932	2	.0312	--	--	--	--	.994	--	.983	.078 (.020,.146)
Multi-group CFA												
Configural	16	19.118	4	.0007	--	--	--	--	.993	--	.980	.101 (.059,.149)
Metric	13	20.455	7	.0047	1.337	2.625	3	.4532	.994	.001	.990	.072 (.037,.110)
Scalar	10	22.441	10	.0130	1.986	.291	3	.9617	.995	.001	.993	.058 (.025,.091)
Config. vs scalar	10	22.441	10	.0130	3.323	3.470	6	.7480	.995	.002	.993	.058 (.025,.091)

Table 16c. Measurement invariance by race for acceptance of female partner violence

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Race												
Hispanic	8	10.259	2	.0059	--	--	--	--	.993	--	.979	.111 (.051,.182)
Black, nh	8	4.352	2	.1135	--	--	--	--	.997	--	.991	.064 (.000,.149)
Other, nh	8	3.324	2	.1898	--	--	--	--	.996	--	.987	.078 (.000,.220)
Multi-group CFA												
Configural	24	18.216	6	.0057	--	--	--	--	.995	--	.984	.091 (.045,.141)
Metric	18	22.187	12	.0355	3.971	5.766	6	.4500	.996	.001	.993	.059 (.015,.097)
Scalar	12	33.739	18	.0136	11.552	12.353	6	.0545	.993	.003	.993	.060 (.027,.091)
Config. vs scalar	12	33.739	18	.0136	15.523	16.484	12	.1701	.993	.002	.993	.060 (.027,.091)

Table 16d. Measurement invariance over time for acceptance of female partner violence

Model	**# para.**	**χ^2**	**df**	***p*-value**	**$\Delta\chi^2$**	**χ^2 diff. test**	**diff. test df**	***p*-value**	**CFI**	**ΔCFI**	**TLI**	**RMSEA (95% CI)**
Time												
Fall 2012	8	18.023	2	.0001	--	--	--	--	.993	--	.978	.104 (.064,.151)
Spring 2013	8	12.634	2	.0018	--	--	--	--	.996	--	.987	.094 (.049,.147)
Fall 2013	8	20.139	2	<.0001	--	--	--	--	.994	--	.981	.110 (.070,.156)
Spring 2014	8	22.924	2	<.0001	--	--	--	--	.994	--	.981	.130 (.086,.181)
All timepoints combined												
Configural	44	174.241	91	<.0001	--	--	--	--	.990	--	.986	.028 (.021,.034)
Metric	35	175.210	100	<.0001	.969	5.912	9	.7487	.991	.001	.989	.025 (.019,.031)
Scalar	26	184.698	109	<.0001	9.488	6.882	9	.6494	.991	.000	.990	.024 (.018,.030)
Config vs scalar	26	184.698	109	<.0001	10.457	12.835	18	.8013	.991	.001	.990	.024 (.018,.030)

Table 17. Unstandardized and standardized factor loadings for adolescent dating violence perpetration by sex over time

Time	Facets	Full sample		Male		Female	
		Unstandardized factor loading estimate (s.e.)	**Standardized factor loading estimate (s.e.)**	**Unstandardized factor loading estimate (s.e.)**	**Standardized factor loading estimate (s.e.)**	**Unstandardized factor loading estimate (s.e.)**	**Standardized factor loading estimate (s.e.)**
T1	Physical	1.000 (.000)	.846 (.033)	1.000 (.000)	.858 (.043)	1.000 (.000)	.841 (.050)
	Relational	.771 (.090)	.652 (.073)	.723 (.116)	.621 (.099)	.826 (.127)	.695 (.097)
	Threatening	.986 (.063)	.834 (.042)	.998 (.075)	.857 (.051)	1.021 (.101)	.859 (.057)
	Severe physical	.994 (.063)	.841 (.042)	.999 (.086)	.857 (.061)	.972 (.091)	.817 (.058)
	Verbal	.938 (.055)	.794 (.033)	.961 (.066)	.825 (.041)	.887 (.083)	.746 (.051)
T2	Physical	1.000 (.000)	.862 (.038)	1.000 (.000)	.773 (.077)	1.000 (.000)	.895 (.041)
	Relational	.821 (.110)	.708 (.087)	1.221 (.168)	.944 (.080)	.573 (.166)	.513 (.147)
	Threatening	.968 (.062)	.835 (.040)	1.082 (.120)	.837 (.063)	.966 (.074)	.864 (.051)
	Severe physical	.920 (.072)	.793 (.051)	.942 (.118)	.728 (.088)	.911 (.094)	.815 (.068)
	Verbal	.944 (.062)	.814 (.036)	1.129 (.151)	.873 (.053)	.847 (.072)	.757 (.056)
T3	Physical	1.000 (.000)	.877 (.027)	1.000 (.000)	.850 (.059)	1.000 (.000)	.876 (.035)
	Relational	.361 (.114)	.317 (.100)	.628 (.108)	.534 (.091)	.226 (.174)	.198 (.152)
	Threatening	1.027 (.044)	.901 (.029)	1.048 (.119)	.891 (.066)	1.044 (.050)	.915 (.031)
	Severe physical	.989 (.051)	.867 (.035)	.902 (.114)	.767 (.076)	1.018 (.064)	.892 (.040)
	Time 4	.910 (.044)	.798 (.030)	.813 (.096)	.692 (.060)	.953 (.060)	.835 (.037)
T4	Physical	1.000 (.000)	.886 (.031)	1.000 (.000)	.949 (.046)	1.000 (.000)	.849 (.043)
	Relational	.772 (.096)	.684 (.035)	.786 (.117)	.746 (.108)	.791 (.127)	.671 (.103)
	Threatening	1.057 (.060)	.937 (.035)	1.001 (.087)	.950 (.051)	1.103 (.084)	.937 (.046)
	Severe physical	.919 (.059)	.814 (.048)	.826 (.094)	.783 (.090)	.974 (.079)	.827 (.057)
	Verbal	.915 (.055)	.811 (.038)	.794 (.090)	.753 (.068)	.974 (.073)	.827 (.046)

Table 18a. Measurement invariance by sex for adolescent dating violence perpetration

Model	**# para.**	**χ^2**	**df**	***p*-value**	**$\Delta\chi^2$**	**χ^2 diff. test**	**diff. test df**	***p*-value**	**CFI**	**ΔCFI**	**TLI**	**RMSEA (95% CI)**
Sex												
Male	24	1.380	3	.7102	--	--	--	--	1.000	--	1.010	.000 (.000,.082)
Female	24	.872	3	.8321	--	--	--	--	1.000	--	1.014	.000 (.000,.069)
Multi-group CFA												
Configural	48	2.247	6	.8957	--	--	--	--	1.000	--	1.012	.000 (.000,.039)
Metric	44	4.623	10	.9149	2.376	1.852	4	.7630	1.000	.000	1.010	.000 (.000,.028)
Scalar	28	41.172	26	.0298	36.549	36.243	16	.0027	.986	-.02	.989	.052 (.017,.081)
Partial scalar	31	21.006	13	.5807	16.383	16.125	13	.2424	1.000	.000	1.002	.000 (.000,.050)
Config. vs partial scalar	31	21.006	13	.5807	16.383	17.370	17	.4296	1.000	.000	1.002	.000 (.000,.050)

Table 18b. Measurement invariance by cohort for adolescent dating violence perpetration

Model	**# para.**	**χ^2**	**df**	***p*-value**	**$\Delta\chi^2$**	**χ^2 diff. test**	**diff. test df**	***p*-value**	**CFI**	**ΔCFI**	**TLI**	**RMSEA (95% CI)**
Cohort												
6th	24	1.307	3	.7275	--	--	--	--	1.000	--	1.008	.000 (.000,.091)
7th	24	2.023	3	.5677	--	--	--	--	1.000	--	1.007	.000 (.000,.089)
Multi-group CFA												
Configural	48	3.345	6	.7644	--	--	--	--	1.000	--	1.008	.000 (.000,.060)
Metric	44	4.095	10	.9430	.7500	.893	4	.9256	1.000	.000	1.010	.000 (.000,.013)
Scalar	28	17.499	26	.8932	12.5895	13.137	16	.6627	1.000	.000	1.006	.000 (.000,.025)
Config. vs scalar	28	17.499	26	.8932	12.5895	13.636	20	.8484	1.000	.000	1.006	.000 (.000,.025)

Table 18c. Measurement invariance by race for adolescent dating violence perpetration

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Race												
Hispanic	24	.573	3	.9026	--	--	--	--	1.000	--	1.013	000 (.000,.053)
Black, nh	24	.355	3	.9493	--	--	--	--	1.000	--	1.015	.000 (.000,.007)
Other, nh	24	2.536	3	.4688	--	--	--	--	1.000	--	1.012	.000 (.000,.220)
Multi-group CFA												
Configural	69	8.785	12	.7212	--	--	--	--	1.000	--	1.006	.000 (.000,.063)
Metric	61	37.892	20	.0009		24.149	8	.0022	.986	-.014	.980	.078 (.038,.116)
Partial metric	63	15.361	18	.6370		5.798	6	.4462	1.000	.000	1.003	.000 (.000,.062)
Partial scalar	36	50.912	45	.2523		36.257	27	.1098	.996	-.004	.997	.030 (.000,.065)
Config. vs partial scalar	36	50.912	45	.2523		40.896	33	.1625	.996	-.004	.997	.030 (.000,.065)

Table 18d. Measurement invariance over time for adolescent dating violence perpetration

Model	# para.	χ^2	df	*p*-value	$\Delta\chi^2$	χ^2 diff. test	diff. test df	*p*-value	CFI	ΔCFI	TLI	RMSEA (95% CI)
Time												
Fall 2012	24	1.168	3	.7606	--	--	--	--	1.000	--	1.006	.000 (.000,.055)
Spring 2013	24	8.023	3	.0455	--	--	--	--	.994	--	.980	.068 (.009,.127)
Fall 2013	24	3.773	3	.2370	--	--	--	--	1.000	--	.998	.023 (.000,.083)
Spring 2014	24	.717	3	.8692	--	--	--	--	1.000	--	1.006	.000 (.000,.047)
All timepoints combined												
Configural	124	157.316	134	.0824	--	--	--	--	.995	--	.993	.014 (.000,.022)
Metric	112	177.991	146	.0368	20.675	20.778	12	.0537	.993	-.002	.991	.016 (.004,.023)
Scalar	64	246.999	194	.0060	69.008	83.166	48	.0012	.989	-.004	.989	.018 (.010,.024)
Config vs scalar	64	246.999	194	.0060	89.683	98.304	60	.0013	.989	-.006	.989	.018 (.010,.024)

Table 19. Unstandardized and standardized parameter estimates for structural paths in Research Question One

Time	Items	Male		Female
		Unstandardized estimate (s.e.)	**Standardized estimate (s.e.)**	**Unstandardized/ Standardized estimate (s.e.)**
T1 (N = 429; N_{male} = 227; N_{female} = 202)	Bullying with ADV	.749 (.127)***	.681 (.096)***	.400 (.090)***
	Bullying with Acceptance of male violence	-.105 (.431)	-.036 (.139)	.172 (.147)
	Bullying with Acceptance of female violence	.007 (.102)	.006 (.083)	-.120 (.121)
	Accept. of male violence with ADV	.550 (.793)	.167 (.118)	.196 (.087)*
	Accept. of female violence with ADV	.278 (.153)	.201 (.103)*	.429 (.084)***
	Accept. of male violence with Accept. of female violence	2.835 (3.621)	.771 (.064)***	.508 (.096)***
T2 (N = 378; N_{male} = 194; N_{female} = 184)	Bullying with ADV	.740 (.282)**	.445 (.115)***	.558 (.052)***
	Bullying with Acceptance of male violence	.898 (.675)	.456 (.206)*	.386 (.155)**
	Bullying with Acceptance of female violence	.671 (.314)*	.431 (.090)***	.254 (.115)*
	Accept. of male violence with ADV	.203 (.123)	.131 (.064)*	.239 (.103)*
	Accept. of female violence with ADV	.415 (.154)**	.338 (.102)**	.392 (.073)***
	Accept. of male violence with Accept. of female violence	1.180 (.659)	.811 (.063)***	.496 (.096)***
T3 (N = 514; N_{male} = 259; N_{female} = 255)	Bullying with ADV	.425 (.124)**	.427 (.076)***	.456 (.099)***
	Bullying with Acceptance of male violence	.206 (.196)	.145 (.111)	.230 (.116)*
	Bullying with Acceptance of female violence	.487 (.203)*	.312 (.123)*	.356 (.094)***
	Accept. of male violence with ADV	.353 (.220)	.305 (.157)	.137 (.117)
	Accept. of female violence with ADV	.427 (.134)**	.334 (.082)***	.292 (.075)***
	Accept. of male violence with Accept. of female violence	1.463 (.790)	.806 (.090)***	.775 (.049)***
T4 (N = 369; N_{male} = 162; N_{female} = 207)	Bullying with ADV	.779 (.184)***	.532 (.084)***	.422 (.100)***
	Bullying with Acceptance of male violence	.354 (.146)*	.459 (.098)***	.324 (.104)**
	Bullying with Acceptance of female violence	.310 (.1130)**	.326 (.102)**	.244 (.126)
	Accept. of male violence with ADV	.187 (.119)	.238 (.106)*	.290 (.131)*
	Accept. of female violence with ADV	.158 (.098)	.163 (.091)	.378 (.069)***
	Accept. of male violence with Accept. of female violence	.383 (.180)*	.751 (.077)***	.680 (.079)***

*** p<.001 ** p<.01 *p<.05

Table 20. Unstandardized and standardized parameter estimates for structural paths in Research Question Two

	Items	Male		Female	
		Unstandardized estimate (s.e.)	**Standardized estimate (s.e.)**	**Unstandardized estimate (s.e.)**	**Standardized estimate (s.e.)**
Bullying perpetration (N = 1105; N_{male} = 504; N_{female} = 601)	T1 Bullying to T2 Bullying	.868 (.186)***	.510 (.099)***	.855 (.117)***	.653 (.054)***
	T1 Bullying to T3 Bullying	.317 (.186)	.205 (.109)	.504 (.183)**	.335 (.112)**
	T1 Bullying to T4 Bullying	-.272 (.214)	-1.68 (.134)	.070 (.230)	.049 (.157)
	T2 Bullying to T3 Bullying	.523 (.097)***	.576 (.13)***	.544 (.121)***	.474 (.094)***
	T2 Bullying to T4 Bullying	.533 (.149)***	.562 (.168)**	.535 (.255)*	.486 (.221)*
	T3 Bullying to T4 Bullying	.277 (.220)	.264 (.208)	.215 (.247)	.224 (.258)
Acceptance of Male Partner Violence (N = 1179; N_{male} = 542; N_{female} = 637)	T1 Accept. of Male Violence to T2 Accept. of Male Violence	.220 (.134)	.155 (4.663)	.220 (.134)	.205 (4.941)
	T1 Accept. of Male Violence to T3 Accept. of Male Violence	.344 (.193)	.441 (10.344)	.344 (.193)	.316 (2.841)
	T1 Accept. of Male Violence to T4 Accept. of Male Violence	.399 (.168)*	.200 (.090)*	.399 (.168)*	.333 (3.023)
	T2 Accept. of Male Violence to T3 Accept. of Male Violence	.109 (.119)	.197 (8.048)	.109 (.119)	.107 (1.828)
	T2 Accept. of Male Violence to T4 Accept. of Male Violence	.271 (.174)	.192 (5.773)	.271 (.174)	.243 (4.140)
	T3 Accept. of Male Violence to T4 Accept. of Male Violence	.228 (.170)	.089 (2.109)	.228 (.170)	.207 (.144)
Acceptance of Female Partner Violence (N = 1165; N_{male} = 537; N_{female} = 682)	T1 Accept. of Female Violence to T2 Accept. of Female Violence	.571 (.134)***	.440 (.068)***	.486 (.107)***	.429 (.078)***
	T1 Accept. of Female Violence to T3 Accept. of Female Violence	.195 (.155)	.124 (.097)	.313 (.085)***	.275 (.070)***
	T1 Accept. of Female Violence to T4 Accept. of Female Violence	-.196 (.145)	-.132 (.099)	.246 (.097)**	.193 (.072)**
	T2 Accept. of Female Violence to T3 Accept. of Female Violence	.451 (.150)**	.374 (.121)**	.293 (.106)**	.292 (.092)**
	T2 Accept. of Female Violence to T4 Accept. of Female Violence	.418 (.146)**	.366 (.090)***	.382 (.129)**	.340 (.1010)**
	T3 Accept. of Female Violence to T4 Accept. of Female Violence	.307 (.111)**	.324 (.108)**	.282 (.089)**	.252 (.081)**
ADV Perpetration (N = 848; N_{male} = 427; N_{female} = 421)	T1 ADV to T2 ADV	.788 (.212)***	.664 (.080)***	.686 (.169)***	.595 (.061)***
	T1 ADV to T3 ADV	.266 (.259)	.214 (.201)	.142 (.178)	.097 (.113)
	T1 ADV to T4 ADV	-1.428 (.374)***	-.968 (.140)***	.199 (.208)	.156 (.161)
	T2 ADV to T3 ADV	.532 (.197)**	.508 (.163)**	.880 (.230)***	.689 (.109)***
	T2 ADV to T4 ADV	1.060 (.385)**	.853 (.298)**	.020 (.324)	.018 (.291)
	T3 ADV to T4 ADV	.666 (.433)	.562 (.334)	.381 (.186)*	.437 (.194)*

*** p<.001 ** p<.01 *p<.05

Table 21. Difference testing results for sex comparisons for Research Questions One and Two

Path	χ^2	df	*p*-value
T1 Bullying with T1 ADV	4.390	1	.0362
T1 Bullying with T1 Acceptance of male partner violence	.374	1	.5406
T1 Bullying with T1 Acceptance of female partner violence	.646	1	.4212
T1 Acceptance of male partner violence with T1 ADV	.210	1	.6469
T1 Acceptance of female partner violence with T1 ADV	.691	1	.4059
T1 Acceptance of male partner violence with T1 Acceptance of female partner violence	.407	1	.5233
T2 Bullying with T2 ADV	.394	1	.5303
T2 Bullying with T2 Acceptance of male partner violence	.524	1	.4693
T2 Bullying with T2 Acceptance of female partner violence	1.445	1	.2294
T2 Acceptance of male partner violence with T2 ADV	.059	1	.8076
T2 Acceptance of female partner violence with T2 ADV	.016	1	.8994
T2 Acceptance of male partner violence with T2 Acceptance of female partner violence	1.056	1	.3042
T3 Bullying with T3ADV	.048	1	.8266
T3 Bullying with T3 Acceptance of male partner violence	.012	1	.9140
T3 Bullying with T3 Acceptance of female partner violence	.335	1	.5627
T3 Acceptance of male partner violence with T3 ADV	.844	1	.3582
T3 Acceptance of female partner violence with T3 ADV	.815	1	.3667
T3 Acceptance of male partner violence with T3 Acceptance of female partner violence	.730	1	.3929
T4 Bullying with T4 ADV	2.938	1	.0865
T4 Bullying with T4 Acceptance of male partner violence	.025	1	.8725
T4 Bullying with T4 Acceptance of female partner violence	.144	1	.7039
T4 Acceptance of male partner violence with T4 ADV	.363	1	.5469
T4 Acceptance of female partner violence with T4 ADV	3.649	1	.0561
T4 Acceptance of male partner violence with T4 Acceptance of female partner violence	1.969	1	.1606
T1 Bullying to T2 Bullying	.004	1	.9525
T1 Bullying to T3 Bullying	.509	1	.4756
T1 Bullying to T4 Bullying	1.184	1	.2766
T2 Bullying to T3 Bullying	.019	1	.8910
T2 Bullying to T4 Bullying	.000	1	.9950
T3 Bullying to T4 Bullying	.035	1	.8518
T1 Accept. of Male Violence to T2 Accept. of Male Violence	2.236	1	.1348
T1 Accept. of Male Violence to T3 Accept. of Male Violence	2.404	1	.1210
T1 Accept. of Male Violence to T4 Accept. of Male Violence	.020	1	.8870
T2 Accept. of Male Violence to T3 Accept. of Male Violence	.092	1	.7621
T2 Accept. of Male Violence to T4 Accept. of Male Violence	.001	1	.9811
T3 Accept. of Male Violence to T4 Accept. of Male Violence	.020	1	.8864
T1 Accept. of Female Violence to T2 Accept. of Female Violence	.031	1	.8594

T1 Accept. of Female Violence to T3 Accept. of Female Violence	.036	1	.8493
T1 Accept. of Female Violence to T4 Accept. of Female Violence	5.914	1	.0150
T2 Accept. of Female Violence to T3 Accept. of Female Violence	.844	1	.3584
T2 Accept. of Female Violence to T4 Accept. of Female Violence	.443	1	.5055
T3 Accept. of Female Violence to T4 Accept. of Female Violence	.304	1	.5813
T1 ADV to T2 ADV	.398	1	.5280
T1 ADV to T3 ADV	.096	1	.7569
T1 ADV to T4 ADV	.000	1	.9832
T2 ADV to T3 ADV	.358	1	.5499
T2 ADV to T4 ADV	.000	1	.9834
T3 ADV to T4 ADV	.000	1	.9843

*** p<.001 ** p<.01 *p<.05

Table 22. Correlation and regression coefficients for Research Question Three Within Time and Auto-Regressive Paths

Path	Male	Female
	Parameter estimate (s.e.)	**Parameter estimate (s.e.)**
T1 Bullying with T1 ADV	.805 (.033)***	.674 (.042)***
T1 Bullying with T1 Acceptance of male partner violence	.175 (.072)*	.183 (.08)*
T1 Bullying with T1 Acceptance of female partner violence	.209 (.067)**	.017 (.094)
T1 Acceptance of male partner violence with T1 ADV	.363 (.044)***	.240 (.07)***
T1 Acceptance of female partner violence with T1 ADV	.340 (.053)***	.449 (.072)***
T1 Acceptance of male partner violence with T1 Acceptance of female partner violence	.919 (.017)***	.700 (.026)***
T2 Bullying with T2 ADV	.602 (.069)***	.724 (.036)***
T2 Bullying with T2 Acceptance of male partner violence	.495 (.072)***	.424 (.076)***
T2 Bullying with T2 Acceptance of female partner violence	.484 (.060)***	.302 (.065)***
T2 Acceptance of male partner violence with T2 ADV	.161 (.046)***	.372 (.080)***
T2 Acceptance of female partner violence with T2 ADV	.423 (.049)***	.459 (.078)***
T2 Acceptance of male partner violence with T2 Acceptance of female partner violence	.906 (.020)***	.724 (.076)***
T3 Bullying with T3ADV	.575 (.061)***	.393 (.055)***
T3 Bullying with T3 Acceptance of male partner violence	.214 (.079)**	.508 (.063)***
T3 Bullying with T3 Acceptance of female partner violence	.327 (.085)***	.404 (.064)***
T3 Acceptance of male partner violence with T3 ADV	.310 (.068)***	.299 (.092)***
T3 Acceptance of female partner violence with T3 ADV	.316 (.074)***	.306 (.094) ***
T3 Acceptance of male partner violence with T3 Acceptance of female partner violence	.917 (.020)***	.918 (.013)***
T4 Bullying with T4 ADV	.668 (.080)***	.522 (.09)***
T4 Bullying with T4 Acceptance of male partner violence	.575 (.067)***	.432 (.073)***
T4 Bullying with T4 Acceptance of female partner violence	.369 (.105)***	.373 (.092)***
T4 Acceptance of male partner violence with T4 ADV	.518 (.173)**	.144 (.094)
T4 Acceptance of female partner violence with T4 ADV	.279 (.180)	.316 (.087)***
T4 Acceptance of male partner violence with T4 Acceptance of female partner violence	.884 (.029)***	.846 (.044)***
T1 Bullying to T2 Bullying	-.087 (.107)	.308 (.150)*
T1 Bullying to T3 Bullying	.203 (.195)	.204 (.142)
T1 Bullying to T4 Bullying	.228 (.186)	.664 (.164)***
T2 Bullying to T3 Bullying	.282 (.131)*	.467 (.118)***
T2 Bullying to T4 Bullying	.131 (.209)	.190 (.248)
T3 Bullying to T4 Bullying	.152 (.153)	.350 (.110)**
T1 Accept. of Male Violence to T2 Accept. of Male Violence	-.429 (.207)	.004 (.074)
T1 Accept. of Male Violence to T3 Accept. of Male Violence	-.009 (.178)	-.304 (.140)*
T1 Accept. of Male Violence to T4 Accept. of Male Violence	.953 (.770)	.027 (.077)
T2 Accept. of Male Violence to T3 Accept. of Male Violence	.410 (.432)	.034 (.132)
T2 Accept. of Male Violence to T4 Accept. of Male Violence	-.466 (.644)	-.078 (.219)
T3 Accept. of Male Violence to T4 Accept. of Male Violence	.423 (.647)	.462 (.259)
T1 Accept. of Female Violence to T2 Accept. of Female Violence	.552 (.160)***	.383 (.169)*

T1 Accept. of Female Violence to T3 Accept. of Female Violence	-.210 (.200)	.445 (.190)(
T1 Accept. of Female Violence to T4 Accept. of Female Violence	-.153 (.395)	.213 (.127)
T2 Accept. of Female Violence to T3 Accept. of Female Violence	.170 (.384)	.211 (.117)
T2 Accept. of Female Violence to T4 Accept. of Female Violence	.331 (.551)	.290 (.215)
T3 Accept. of Female Violence to T4 Accept. of Female Violence	.131 (.420)	-.069 (.225)
T1 ADV to T2 ADV	.679 (.157)***	.428 (.157)**
T1 ADV to T3 ADV	.243 (.278)	.175 (.157)
T1 ADV to T4 ADV	-.432 (.333)	-.281 (.096)**
T2 ADV to T3 ADV	.864 (.229)***	.477 (.151)**
T2 ADV to T4 ADV	.126 (.317)	-.034 (.246)
T3 ADV to T4 ADV	.429 (.192)*	.494 (.114)***

*** p<.001 ** p<.01 *p<.05

Table 23. Regression coefficients for Research Question Three Cross-Lagged Paths

Path	Male	Female
	Standardized estimate (s.e.)	**Standardized estimate (s.e.)**
T1 Bullying to T2 ADV	-.209 (.098)*	.086 (.137)
T1 Bullying to T3 ADV	-.028 (.178)	.115 (.145)
T1 Bullying to T4 ADV	.115 (.170)	.289 (.106)**
T2 Bullying to T3 ADV	-.239 (.116)*	.159 (.165)
T2 Bullying to T4 ADV	.004 (.197)	.349 (.286)
T3 Bullying to T4 ADV	.153 (.193)	-.146 (.090)
T1 Bullying to T2 Acceptance of male partner violence	.021 (.179)	.400 (.194)*
T1 Bullying to T3 Acceptance of male partner violence	-.144 (.116)	.361 (.195)
T1 Bullying to T4 Acceptance of male partner violence	.021 (.236)	-.184 (.211)
T2 Bullying to T3 Acceptance of male partner violence	-.275 (.201)	-.114 (.143)
T2 Bullying to T4 Acceptance of male partner violence	-.157 (.276)	.258 (.295)
T3 Bullying to T4 Acceptance of male partner violence	.075 (.174)	.088 (.178)
T1 Bullying to T2 Acceptance of female partner violence	-.074 (.133)	.346 (.203)
T1 Bullying to T3 Acceptance of female partner violence	-.159 (.154)	.354 (.164)*
T1 Bullying to T4 Acceptance of female partner violence	-.139 (.239)	.111 (.164)
T2 Bullying to T3 Acceptance of female partner violence	-.082 (.187)	.024 (.117)
T2 Bullying to T4 Acceptance of female partner violence	-.438 (.258)	.435 (.225)
T3 Bullying to T4 Acceptance of female partner violence	.052 (.177)	.077 (.168)
T1 Acceptance of male partner violence to T2 Bullying	-.583 (.186)**	-.066 (.082)
T1 Acceptance of male partner violence to T3 Bullying	.339 (.200)	.087 (.133)
T1 Acceptance of male partner violence to T4 Bullying	.213 (.328)	-.217 (.139)
T2 Acceptance of male partner violence to T3 Bullying	.002 (.376)	-.199 (.173)
T2 Acceptance of male partner violence to T4 Bullying	-.220 (.410)	-.047 (.238)
T3 Acceptance of male partner violence to T4 Bullying	-.678 (.249)**	.255 (.204)
T1 Acceptance of male partner violence to T2 ADV	-.611 (.193)**	.080 (.112)
T1 Acceptance of male partner violence to T3 ADV	.070 (.201)	.134 (.115)
T1 Acceptance of male partner violence to T4 ADV	.238 (.392)	-.157 (.107)
T2 Acceptance of male partner violence to T3 ADV	.449 (.340)	-.070 (.117)
T2 Acceptance of male partner violence to T4 ADV	-.538 (.307)	.041 (.256)
T3 Acceptance of male partner violence to T4 ADV	.115 (.386)	.276 (.199)
T1 Acceptance of male partner violence to T2 Acceptance of female partner violence	-.609 (.185)***	-.066 (.114)
T1 Acceptance of male partner violence to T3 Acceptance of female partner violence	.147 (.257)	-.240 (.140)
T1 Acceptance of male partner violence to T4 Acceptance of female partner violence	.318 (.574)	.029 (.065)
T2 Acceptance of male partner violence to T3 Acceptance of female partner violence	-.029 (.385)	-.187 (.119)

T2 Acceptance of male partner violence to T4 Acceptance of female partner violence	-.005 (.479)	-.228 (.261)
T3 Acceptance of male partner violence to T4 Acceptance of female partner violence	-.254 (.466)	.207 (.215)
T1 Acceptance of female partner violence to T2 Bullying	.488 (.178)**	.031 (.108)
T1 Acceptance of female partner violence to T3 Bullying	-.461 (.140)***	.019 (.193)
T1 Acceptance of female partner violence to T4 Bullying	-.092 (.204)	.253 (.186)
T2 Acceptance of female partner violence to T3 Bullying	-.046 (.429)	-.137 (.244)
T2 Acceptance of female partner violence to T4 Bullying	.182 (.523)	.040 (.117)
T3 Acceptance of female partner violence to T4 Bullying	.454 (.251)	-.311 (.203)
T1 Acceptance of female partner violence to T2 ADV	.555 (.178)**	-.134 (.123)
T1 Acceptance of female partner violence to T3 ADV	-.120 (.201)	-.190 (.169)
T1 Acceptance of female partner violence to T4 ADV	-.040 (.282)	.473 (.110)***
T2 Acceptance of female partner violence to T3 ADV	-.514 (.347)	-.052 (.081)
T2 Acceptance of female partner violence to T4 ADV	.612 (.283)*	-.287 (.233)
T3 Acceptance of female partner violence to T4 ADV	-.315 (.395)	-.154 (.235)
T1 Acceptance of female partner violence to T2 Acceptance of male partner violence	.361 (.179)*	.139 (.093)
T1 Acceptance of female partner violence to T3 Acceptance of male partner violence	-.121 (.106)	.506 (.205)*
T1 Acceptance of female partner violence to T4 Acceptance of male partner violence	-.772 (.469)	.133 (.147)
T2 Acceptance of female partner violence to T3 Acceptance of male partner violence	-.261 (.384)	.045 (.143)
T2 Acceptance of female partner violence to T4 Acceptance of male partner violence	.787 (.697)	.102 (.164)
T3 Acceptance of female partner violence to T4 Acceptance of male partner violence	-.561 (.605)	-.286 (.280)
T1 ADV to T2 Bullying	.505 (.111)***	.156 (.152)
T1 ADV to T3 Bullying	.049 (.270)	.058 (.158)
T1 ADV to T4 Bullying	-.225 (.380)	-.586 (.157)***
T2 ADV to T3 Bullying	.231 (.275)	-.010 (.154)
T2 ADV to T4 Bullying	-.050 (.231)	.308 (.254)
T3 ADV to T4 Bullying	.400 (.160)*	-.072 (.112)
T1 ADV to T2 Acceptance of male partner violence	.116 (.178)	-.183 (.181)
T1 ADV to T3 Acceptance of male partner violence	.515 (.148)***	-.335 (.212)
T1 ADV to T4 Acceptance of male partner violence	.015 (.610)	.302 (.169)
T2 ADV to T3 Acceptance of male partner violence	.462 (.294)	.315 (.145)*
T2 ADV to T4 Acceptance of male partner violence	.031 (.537)	-.440 (.295)
T3 ADV to T4 Acceptance of male partner violence	.107 (.247)	.256 (.169)
T1 ADV to T2 Acceptance of female partner violence	.303 (.121)**	-.194 (.214)
T1 ADV to T3 Acceptance of female partner violence	.400 (.214)	-.309 (.187)
T1 ADV to T4 Acceptance of female partner violence	.322 (.489)	.111 (.164)
T2 ADV to T3 Acceptance of female partner violence	.247 (.273)	.322 (.123)**
T2 ADV to T4 Acceptance of female partner violence	.199 (.474)	-.470 (.220)*
T3 ADV to T4 Acceptance of female partner violence	.015 (.204)	.380 (.158)*

*** p<.001 ** p<.01*p<.05

Table 24. Differences in regression coefficients for males and female in Research Question Three Cross-Lagged Paths

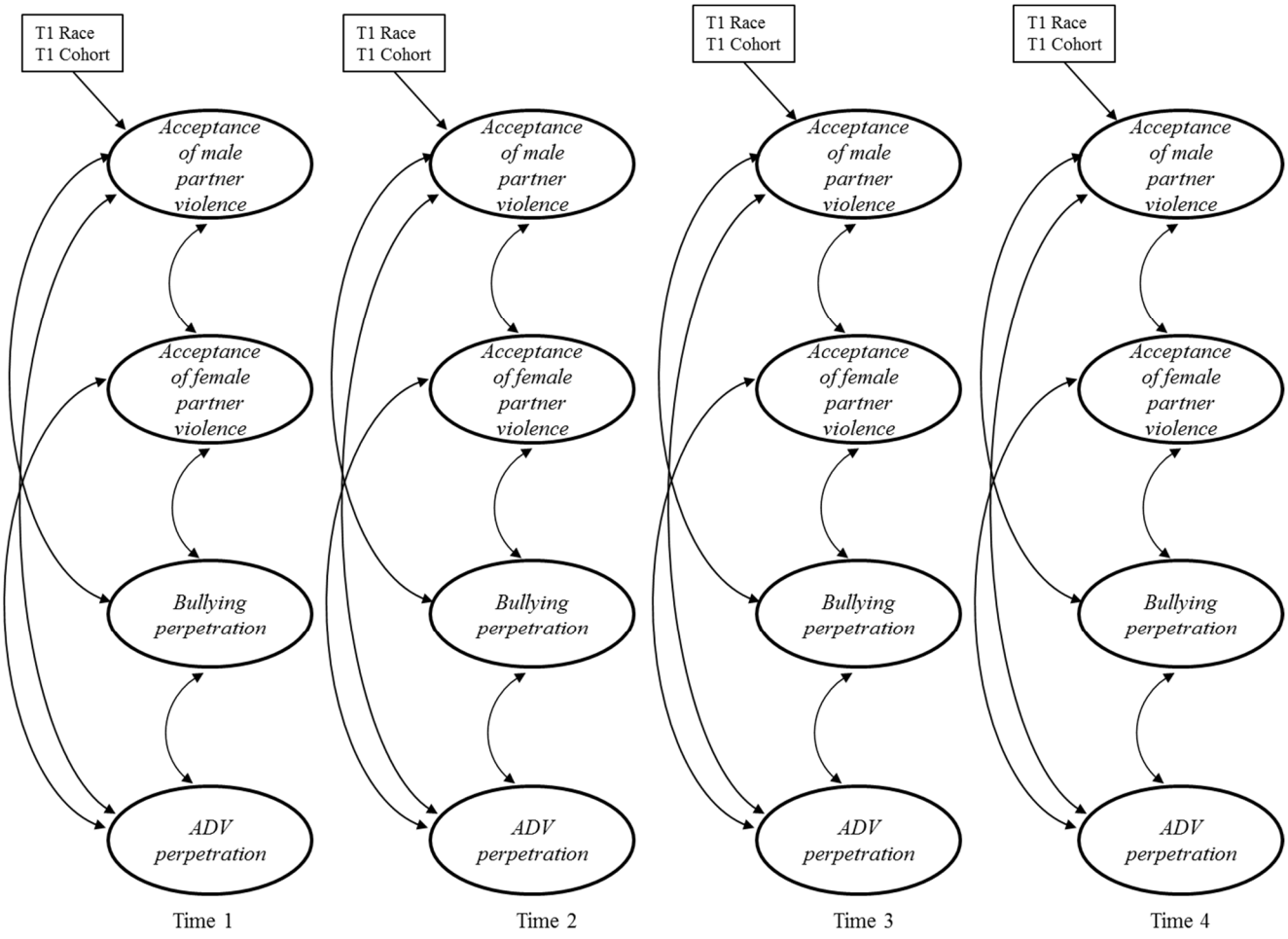
Path	Unstandardized estimate	Standard error
T1 Bullying to T2 ADV	0.391	0.205
T1 Bullying to T3 ADV	0.166	0.27
T1 Bullying to T4 ADV	0.218	0.215
T2 Bullying to T3 ADV	0.369	0.212
T2 Bullying to T4 ADV	0.392	0.299
T3 Bullying to T4 ADV	-0.348	0.249
T1 Bullying to T2 Acceptance of male partner violence	0.341	0.186
T1 Bullying to T3 Acceptance of male partner violence	0.527*	0.23
T1 Bullying to T4 Acceptance of male partner violence	-0.182	0.314
T2 Bullying to T3 Acceptance of male partner violence	0.205	0.271
T2 Bullying to T4 Acceptance of male partner violence	0.352	0.289
T3 Bullying to T4 Acceptance of male partner violence	-0.006	0.304
T1 Bullying to T2 Acceptance of female partner violence	0.416*	0.186
T1 Bullying to T3 Acceptance of female partner violence	0.529*	0.237
T1 Bullying to T4 Acceptance of female partner violence	-0.069	0.217
T2 Bullying to T3 Acceptance of female partner violence	0.098	0.202
T2 Bullying to T4 Acceptance of female partner violence	0.615**	0.219
T3 Bullying to T4 Acceptance of female partner violence	0.034	0.235
T1 Acceptance of male partner violence to T2 Bullying	0.454*	0.199
T1 Acceptance of male partner violence to T3 Bullying	-0.144	0.211
T1 Acceptance of male partner violence to T4 Bullying	-0.439	0.326
T2 Acceptance of male partner violence to T3 Bullying	-0.215	0.392
T2 Acceptance of male partner violence to T3 Bullying	0.161	0.587
T3 Acceptance of male partner violence to T4 Bullying	0.785*	0.323
T1 Acceptance of male partner violence to T2 ADV	0.754**	0.274
T1 Acceptance of male partner violence to T3 ADV	0.154	0.206
T1 Acceptance of male partner violence to T4 ADV	-0.429	0.431
T2 Acceptance of male partner violence to T3 ADV	-0.506	0.34
T2 Acceptance of male partner violence to T3 ADV	0.618	0.329
T3 Acceptance of male partner violence to T4 ADV	0.265	0.267
T1 Acceptance of male partner violence to T2 Acceptance of female partner violence	0.378	0.25
T1 Acceptance of male partner violence to T3 Acceptance of female partner violence	-0.422	0.284
T1 Acceptance of male partner violence to T4 Acceptance of female partner violence	-0.134	0.327
T2 Acceptance of male partner violence to T3 Acceptance of female partner violence	-0.172	0.426

T2 Acceptance of male partner violence to T3 Acceptance of female partner violence	-0.22	0.365
T3 Acceptance of male partner violence to T4 Acceptance of female partner violence	0.329	0.306
T1 Acceptance of female partner violence to T2 Bullying	-0.625*	0.267
T1 Acceptance of female partner violence to T3 Bullying	0.512	0.277
T1 Acceptance of female partner violence to T4 Bullying	0.359	0.268
T2 Acceptance of female partner violence to T3 Bullying	0.084	0.433
T2 Acceptance of female partner violence to T3 Bullying	-0.325	0.718
T3 Acceptance of female partner violence to T4 Bullying	-0.724*	0.309
T1 Acceptance of female partner violence to T2 ADV	-0.996***	0.311
T1 Acceptance of female partner violence to T3 ADV	-0.105	0.222
T1 Acceptance of female partner violence to T4 ADV	0.609	0.361
T2 Acceptance of female partner violence to T3 ADV	0.427	0.315
T2 Acceptance of female partner violence to T3 ADV	-1.009**	0.341
T3 Acceptance of female partner violence to T4 ADV	0.117	0.301
T1 Acceptance of female partner violence to T2 Acceptance of male partner violence	-0.284	0.226
T1 Acceptance of female partner violence to T3 Acceptance of male partner violence	0.645**	0.21
T1 Acceptance of female partner violence to T4 Acceptance of male partner violence	1.035	0.609
T2 Acceptance of female partner violence to T3 Acceptance of male partner violence	0.397	0.486
T2 Acceptance of female partner violence to T3 Acceptance of male partner violence	-0.766	0.762
T3 Acceptance of female partner violence to T4 Acceptance of male partner violence	0.287	0.659
T1 ADV to T2 Bullying	-0.344*	0.154
T1 ADV to T3 Bullying	0.007	0.224
T1 ADV to T4 Bullying	-0.293	0.279
T2 ADV to T3 Bullying	-0.173	0.261
T2 ADV to T4 Bullying	0.289	0.246
T3 ADV to T4 Bullying	-0.485*	0.205
T1 ADV to T2 Acceptance of male partner violence	-0.222	0.151
T1 ADV to T3 Acceptance of male partner violence	-0.775***	0.213
T1 ADV to T4 Acceptance of male partner violence	0.192	0.511
T2 ADV to T3 Acceptance of male partner violence	-0.228	0.33
T2 ADV to T4 Acceptance of male partner violence	-0.331	0.382
T3 ADV to T4 Acceptance of male partner violence	0.061	0.293
T1 ADV to T2 Acceptance of female partner violence	-0.381**	0.144
T1 ADV to T3 Acceptance of female partner violence	-0.584**	0.194
T1 ADV to T4 Acceptance of female partner violence	-0.092	0.32
T2 ADV to T3 Acceptance of female partner violence	0.05	0.261
T2 ADV to T4 Acceptance of female partner violence	-0.437	0.25
T3 ADV to T4 Acceptance of female partner violence	0.267	0.177

*** p<.001 ** p<.01*p<.05

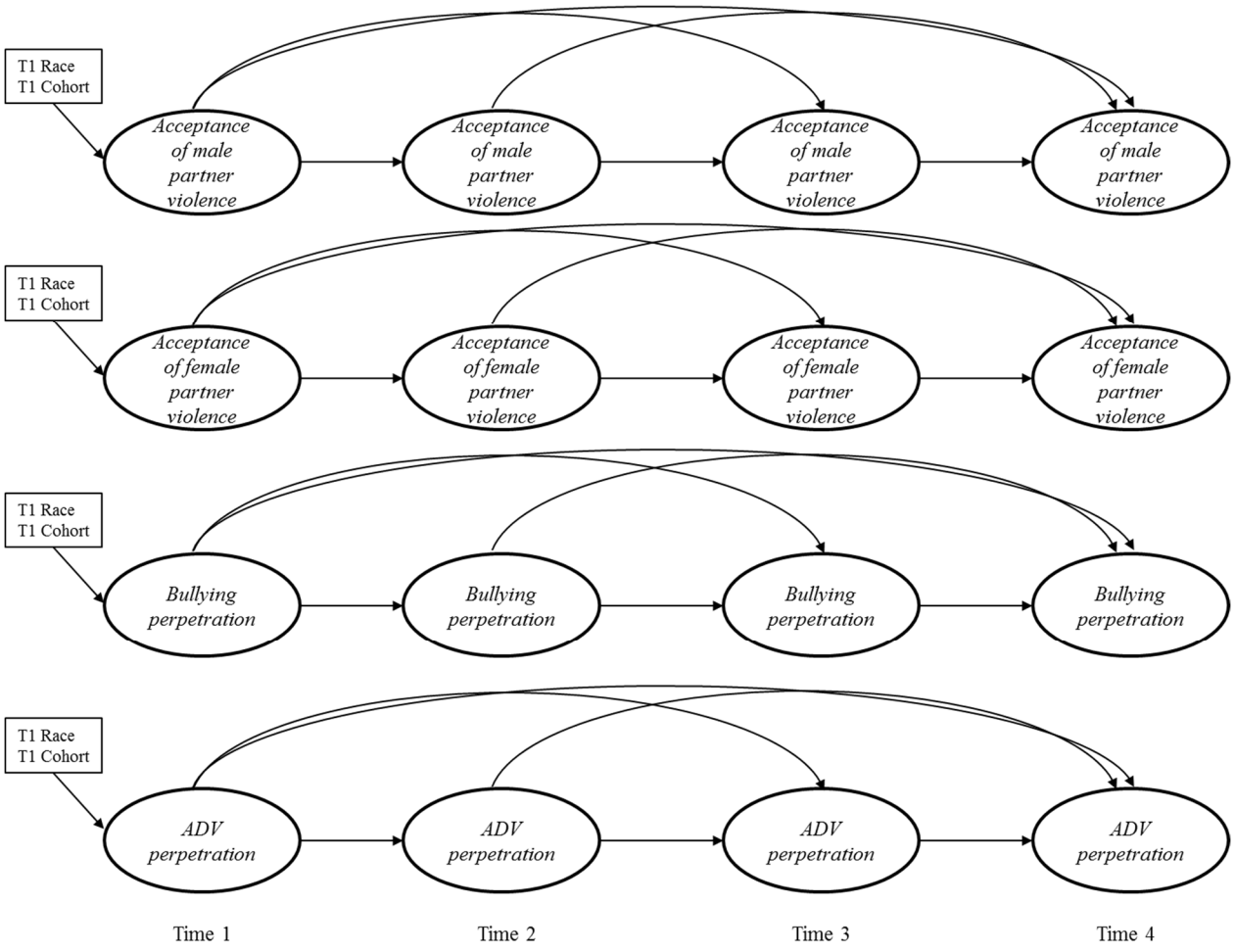
Figures

Figure 1: Research Question One Path model
Are there concurrent associations between acceptance of partner violence, bullying victimization and perpetration, and adolescent dating violence perpetration at each time point?



Note: Models are identical for both male and female students.

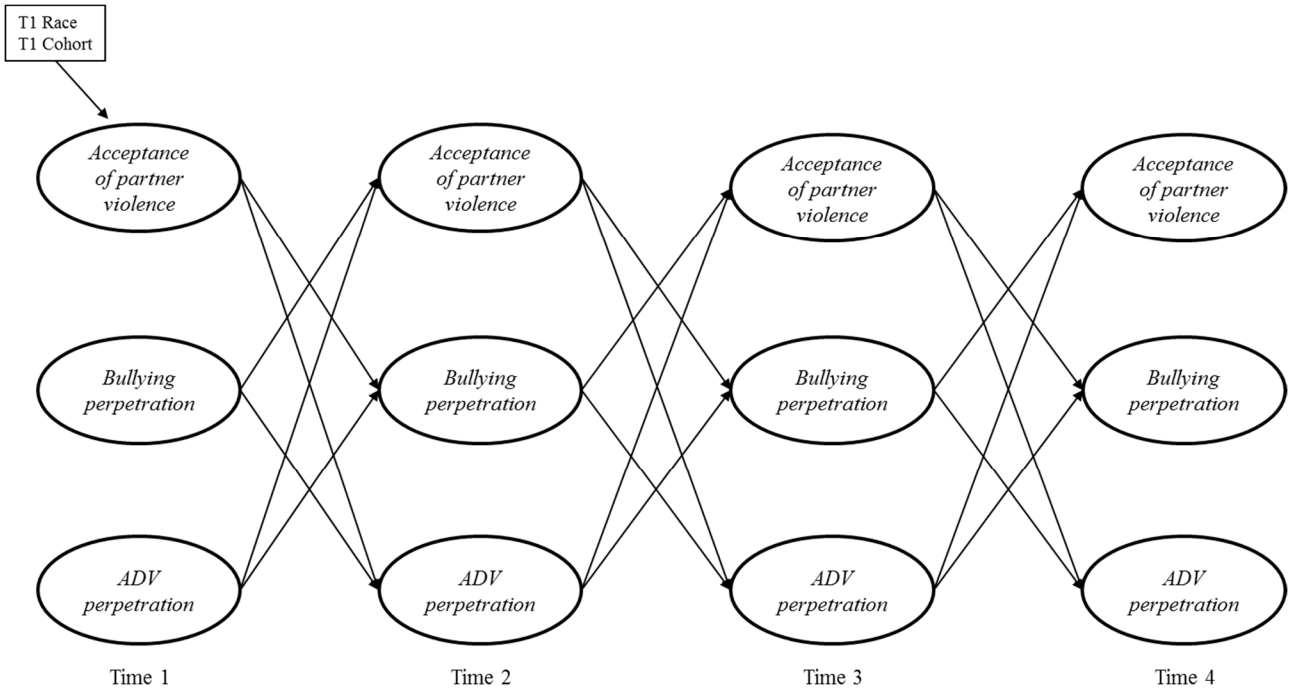
Figure 2: Research Question Two Path model
Are norms and behaviors stable over time?



Note: Models are identical for both male and female students.

Figure 3: Research Question Three Path model

Do norms and behaviors at Time T predict behaviors and norms across outcomes at T+1, T+2, and T+3 (e.g., does T1 bullying predict T2 ADV and does T2 norms predict T3 ADV)?



Note: Acceptance of partner violence includes two subscales (male-to-female violence acceptance and female-to-male violence acceptance), however, for visual ease only the larger constructs are included in these figures. In addition, all longitudinal paths will be estimated even if they are note represented in this visual. Models are identical for both male and female students.

Figure 4: A graphical depiction of the Dating Matters® cohorts, by grade and school year

Grade/Year	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
6th	3	4	5			
7th	2	3	4	5		
8th	1	2	3	4	5	
9th		1	2	3	4	5
10th			1	2	3	4
11th				1	2	3
12th					1	2

Note. Cohort 1 is blue; Cohort 2 is red; Cohort 3 is purple; Cohort 4 is green; Cohort 5 is yellow.

Figure 5: Structure of bullying perpetration

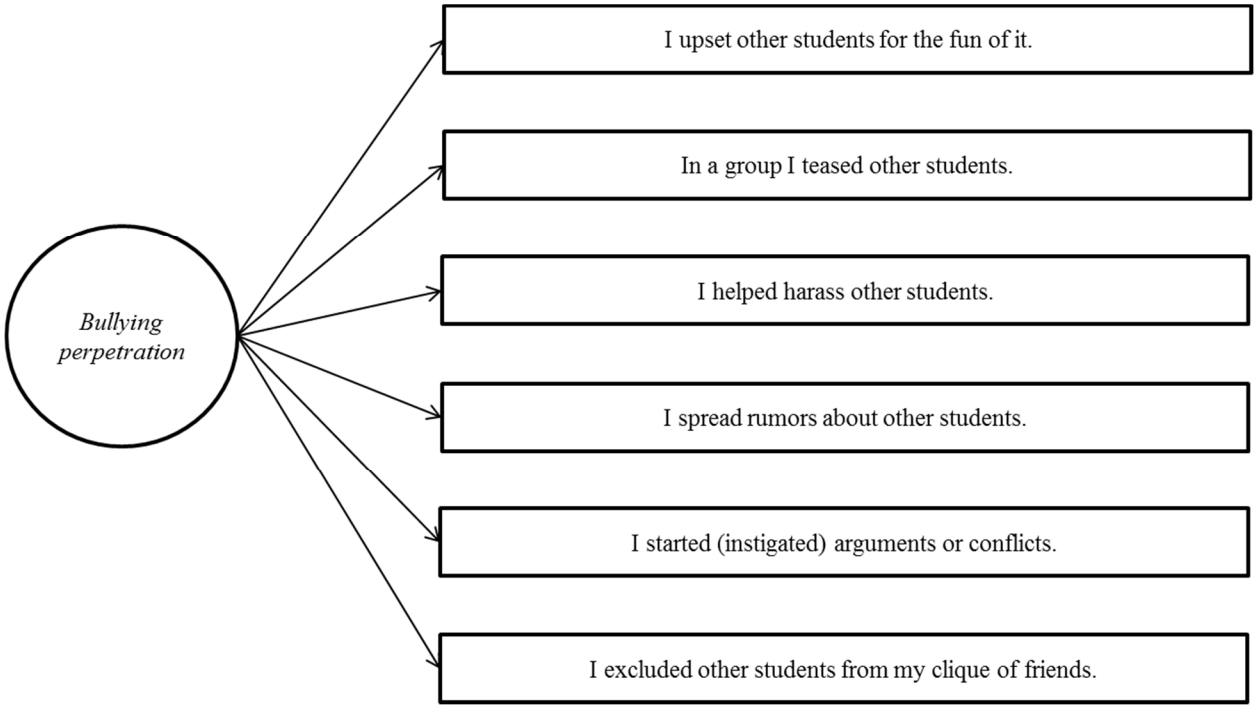


Figure 6: Structure of acceptance of partner violence

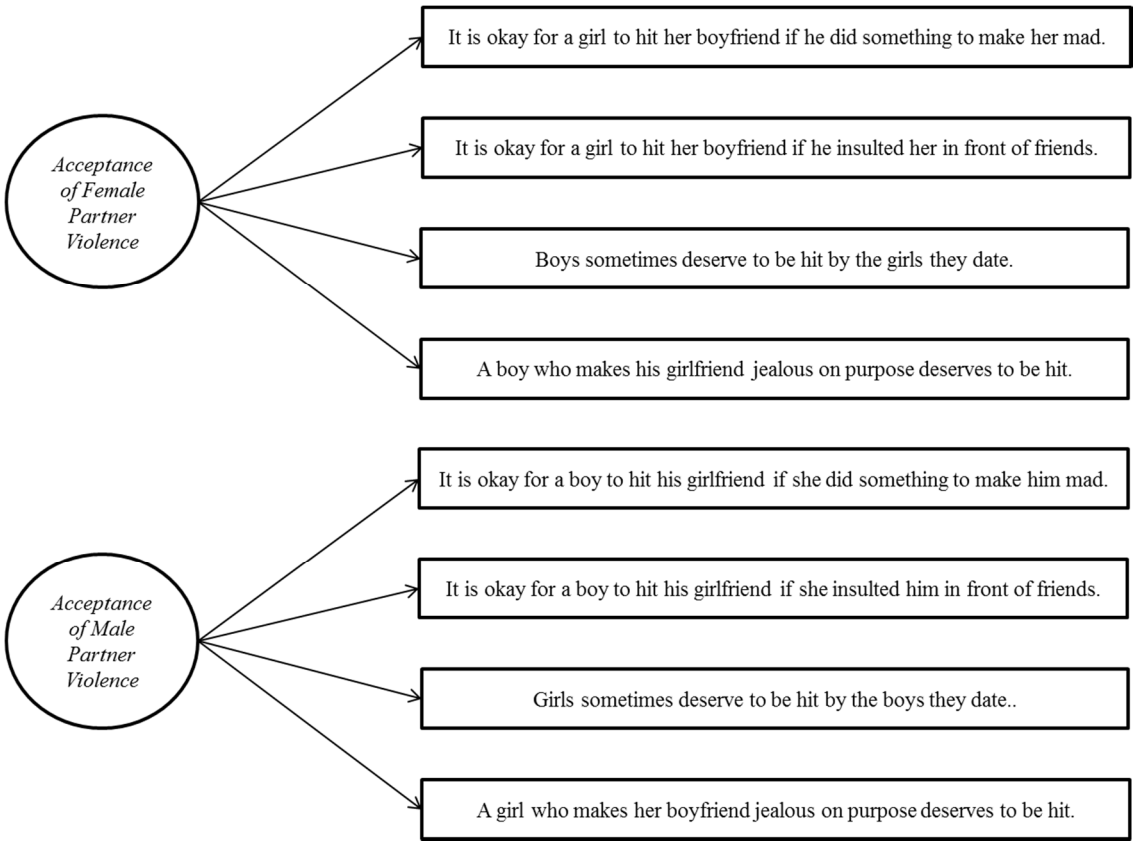


Figure 7: Structure of adolescent dating violence perpetration

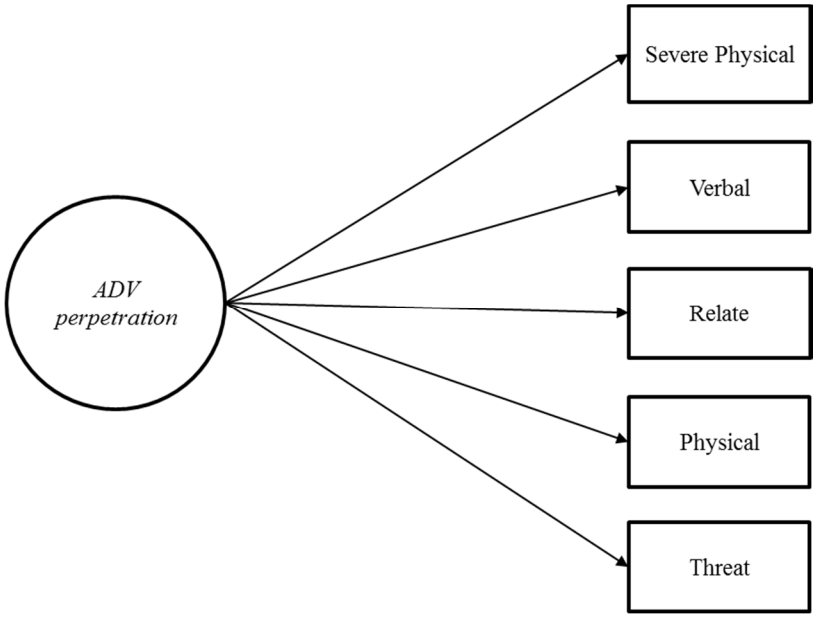
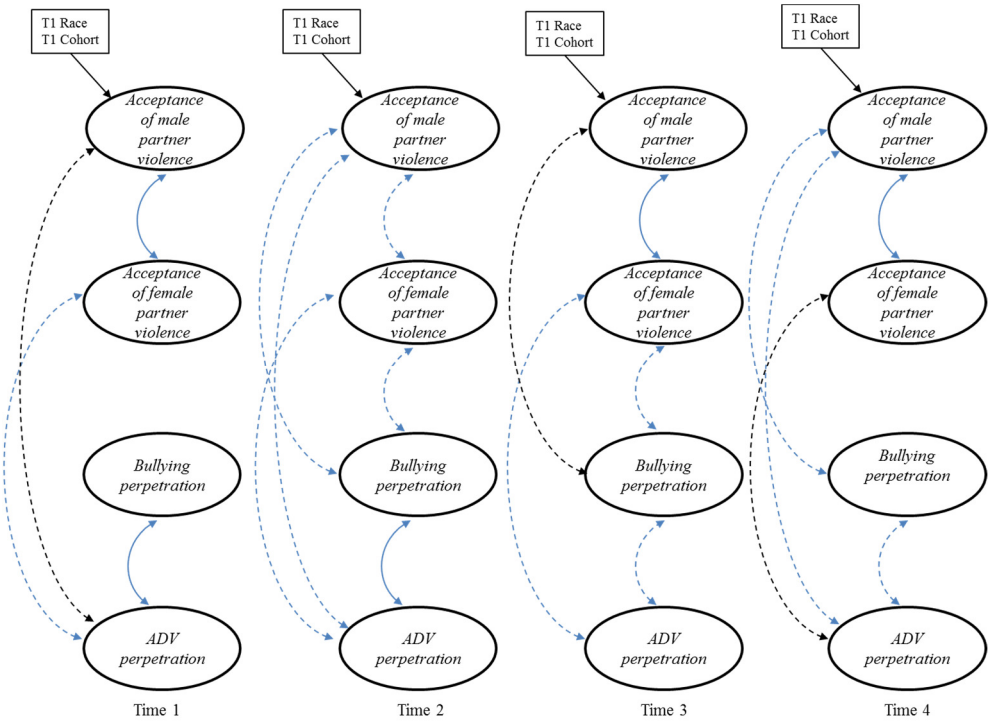
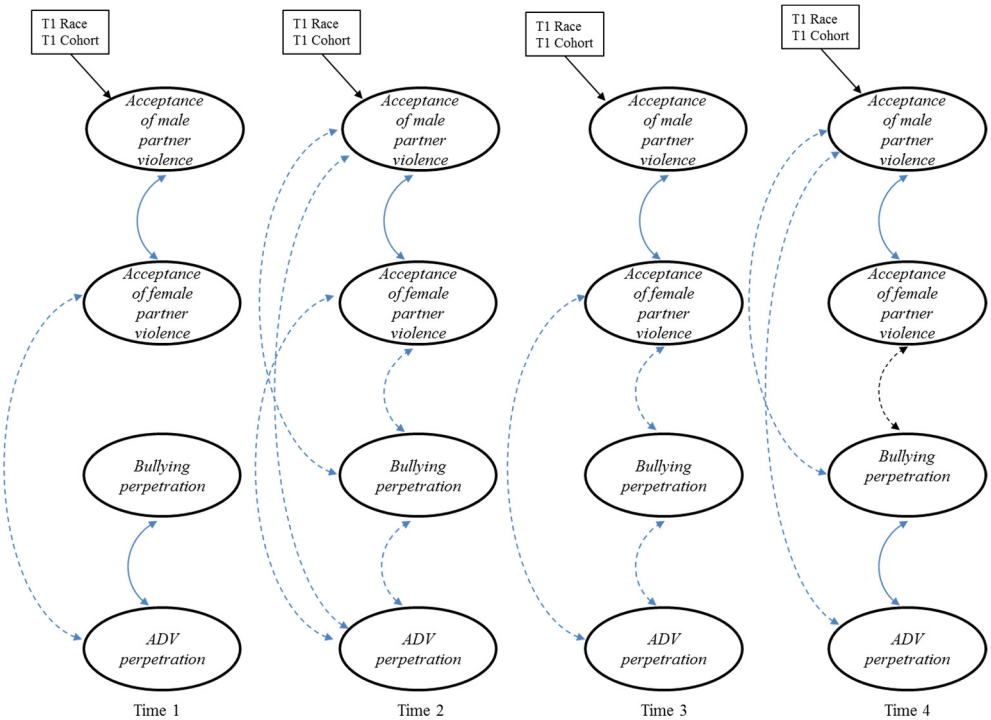


Figure 8: Research Question One – Significant Associations for Males and Females

Female Models



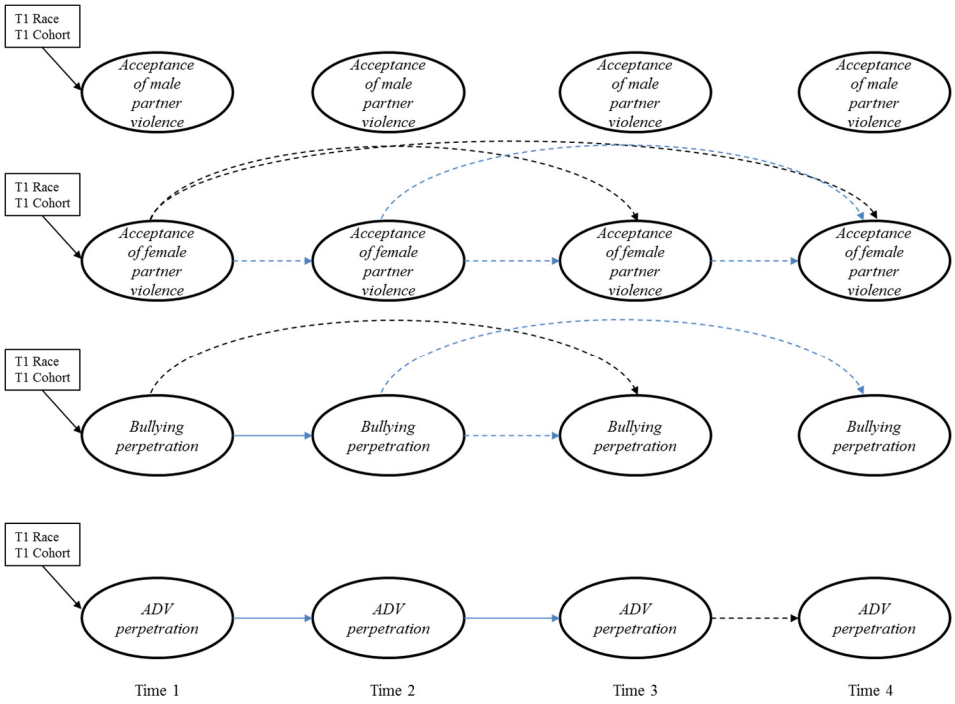
Male Models



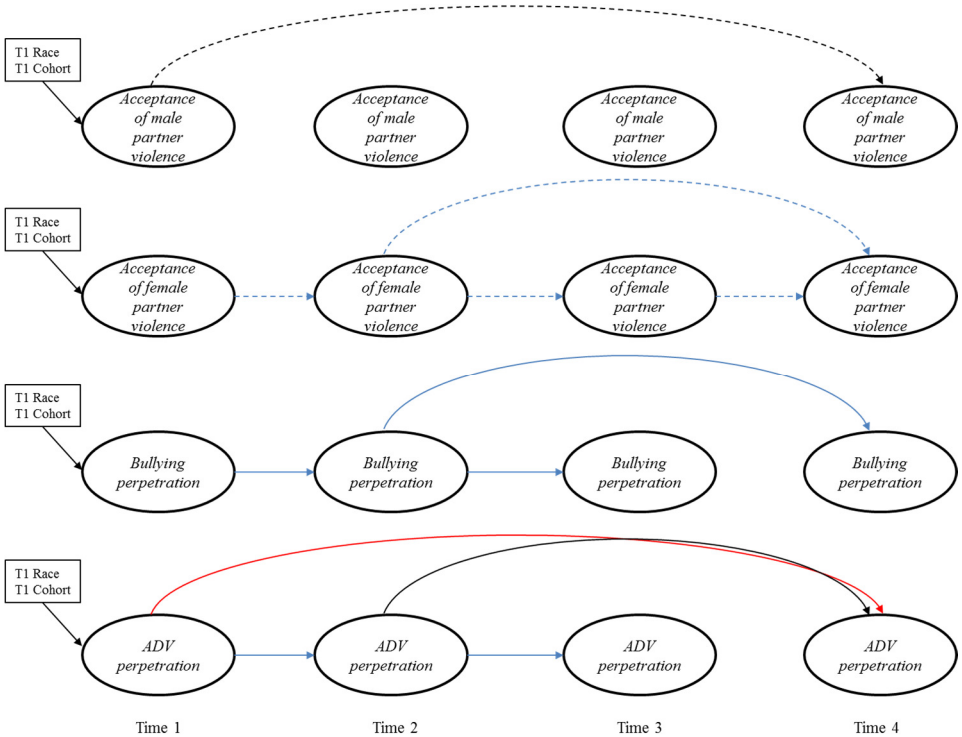
Note: solid lines indicate $r > .50$; dotted lines indicate $r < .49$; blue lines indicate a consistent association across males and females

Figure 9: Research Question Two – Significant Associations for Males and Females

Female Models



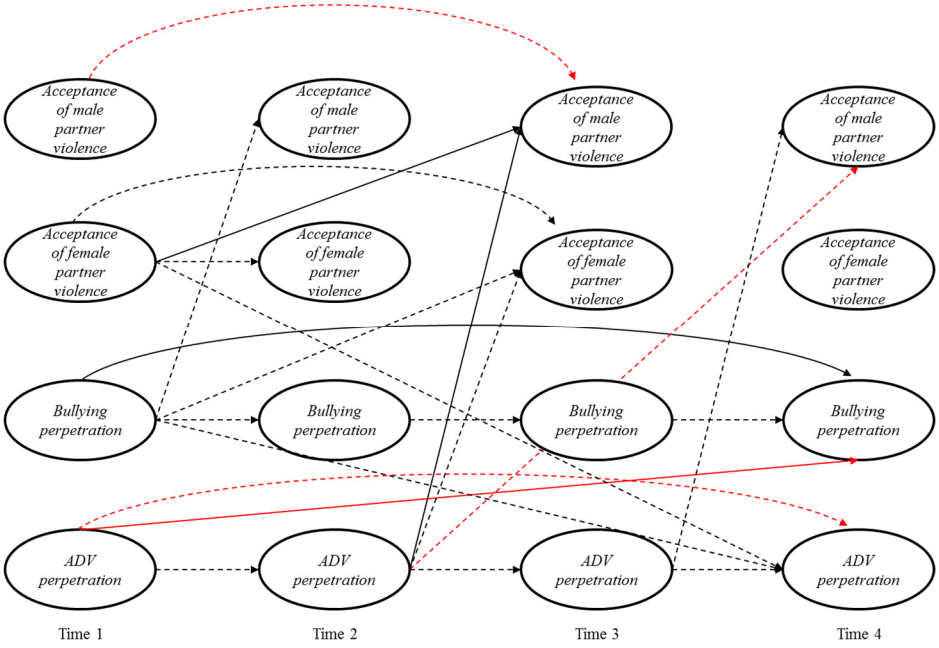
Male Models



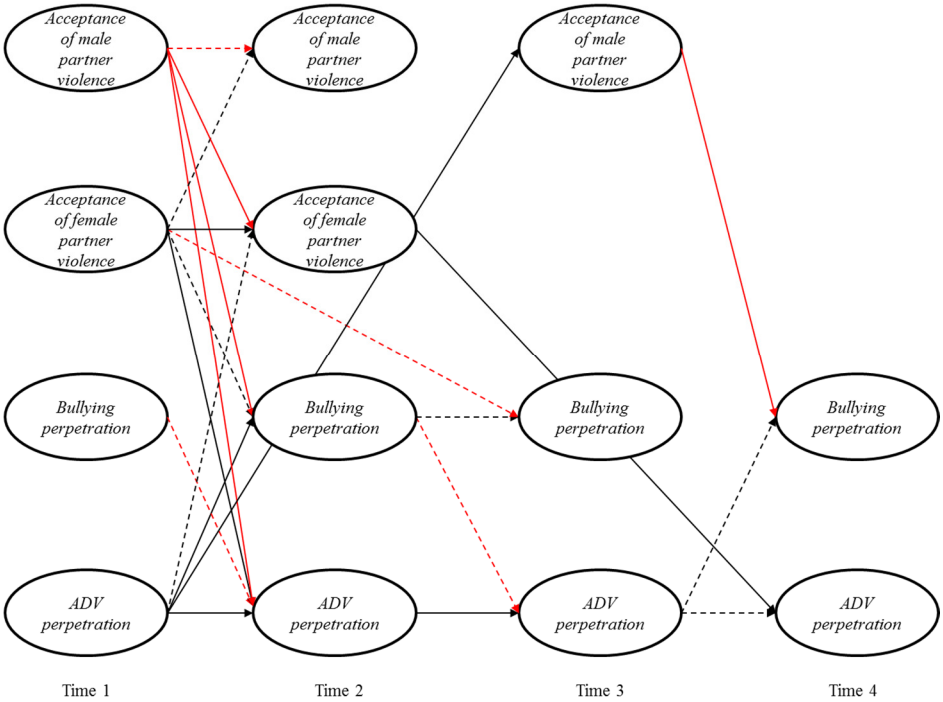
Note: solid lines indicate $r > .50$; dotted lines indicate $r < .49$; blue lines indicate a consistent association across males and females; red lines indicate a negative association

Figure 10: Research Question Three – Significant Cross-lagged and Auto-regressive Paths for Males and Females

Female Models



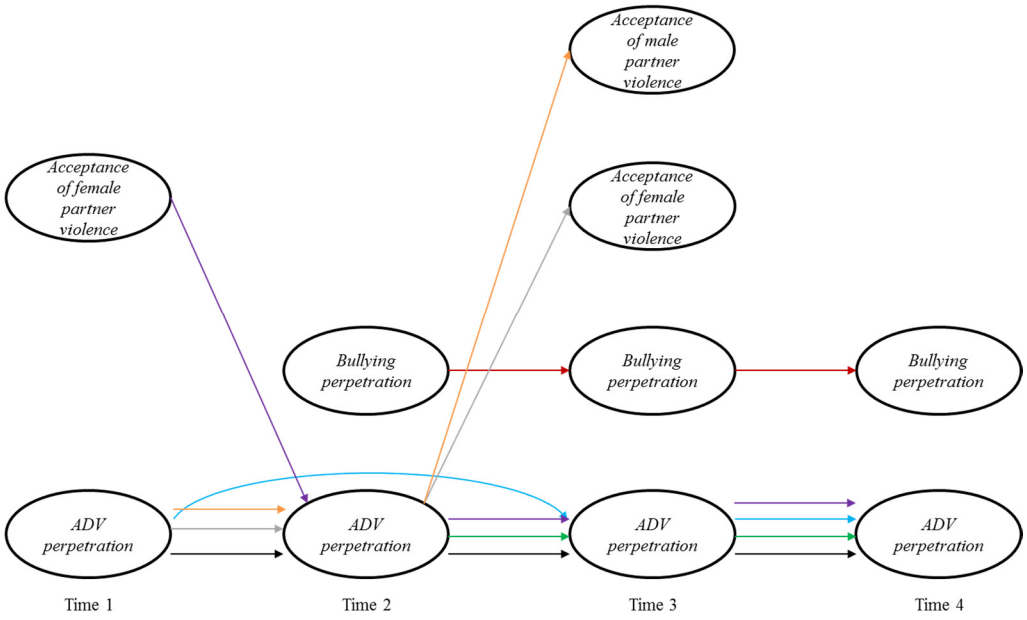
Male Models



Note: solid lines indicate $r > .50$; dotted lines indicate $r < .49$; blue lines indicate a consistent association across males and females; red lines indicate a negative association

Figure 11: Research Question Four – Significant Indirect Paths for Males and Females

Female Models



Male Models